SEPT. 14, 1950

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WHAT GOVERN THE USE OF VARIOUS PAPERMAKING MATERIALS?

Paper TRADE JOURNAL

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STABILIZED *Sodium Aluminate*

100% Soluble

100% Stable • 100% Available

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"Machine tenders report much better sheet formation with Nalco 680, and that jordans can be cut back 10 amps. Machines are cleaner with no deposits on cylinders."

KRAFT MILL—Alumina Retention

"Improvement in sizing, better retention of alumina, and general texture of the sheet using Nalco 680 are very marked. Converter reports the sheet handles better."

SULFITE BOND MILL—45% Less Alum

"Results using Nalco 680 at the rate of five pounds per ton have been good. Improved sizing and reduced alum from 250 to 140 pounds per 4500 pounds of furnish. This enabled the mill to meet rigid pH specifications for the paper."

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FIBREpulper

BY DOWNINGTOWN

marks major pulping advance

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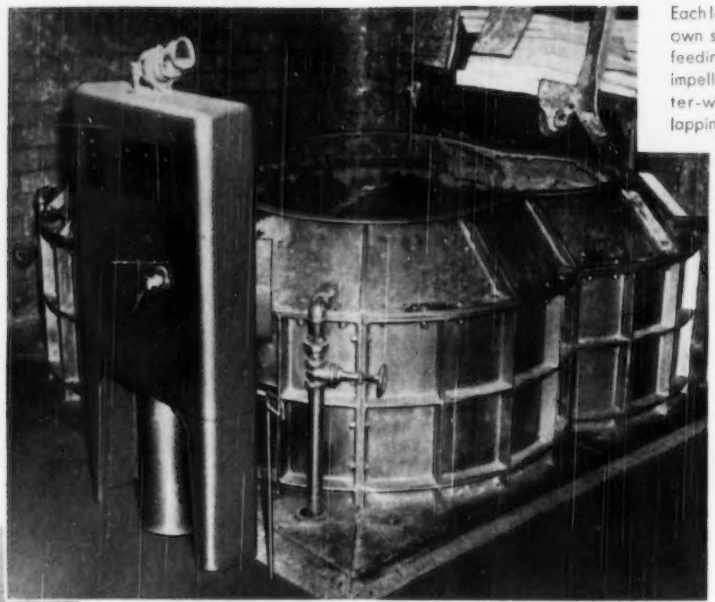
FIBREpulper designed and custom-built for your operating conditions

Here's why

Each lobe develops its own stream of stock, feeding back to the impeller, with an inter-weaving, overlapping pattern.



Operating-floor view of FIBREpulper and auxiliary equipment in large eastern tissue mill.

Internal view of tub, showing rotor and extraction plates.

FIBREpulper being charged with baled pulp from conveyor.

Advantages: **Less horsepower per ton**

Shorter pulping period— less hydration—higher freeness

Shorter pulping period also means smaller unit for given tonnage

Easier to "floor plan"

More pulping for your money

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DOWNINGTOWN, PA.

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Here is how modern paper mill operators are making vital savings with

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THE BECKMAN MODEL H-2 pH METER

is one of a complete range of Beckman pH Meters available for every type of application*. The H-2 is particularly recommended for applications where high accuracy and simple operation—combined with the convenience and low cost of 115-v. AC operation—are desired.

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Built-in electrode support and compact case design save valuable space and permit easy portability to various plant locations.

Particularly important is the wide range of factory-sealed, maintenance-free Beckman Glass Electrodes available for use with this instrument . . . electrodes that are virtually unbreakable . . . that cover extreme temperature ranges from below freezing to above boiling . . . that have an unprecedented pH range with negligible errors . . . that are abrasion-resistant and chemically durable to a degree never before thought possible in glass electrodes.

*In addition to the H-2 Meter, other Beckman pH equipment includes completely automatic pH indication and control instruments for large-scale process applications . . . battery-operated models for complete portability in plant and field use . . . and a laboratory type instrument that features maximum versatility and accuracy for research and laboratory applications

Throughout the pulp and paper mill industry, profit-minded operators are stepping up plant efficiency, reducing waste and cutting costly maintenance by Beckman-controlling the pH of an increasing variety of paper mill operations. For example . . .

In both hard and soft water areas Beckman pH control is used to insure more uniform pre-conditioning of the plant water and substantial savings in chemicals.

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Printing qualities of the finished paper—its ability to take ink, its whiteness, its strength and its color stability—are also closely dependent upon accurate pH control.

These and many other important paper mill applications are outlined in a helpful pulp and paper mill bulletin available on request. Write for your free copy today!

WHY BECKMAN pH CONTROL? Leading paper plants prefer Beckman pH control because only Beckman provides the rugged, abrasion-resisting, high pH type of glass electrodes necessary for sustained accuracy and long life in modern paper mill operations. And, as outlined at left, Beckman provides the industry's most complete selection of pH equipment.

Let your nearest Beckman instrument dealer point out the many important advantages found exclusively in Beckman pH equipment. Or write direct.

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Associate Editor

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VOL. 131 SEPTEMBER 14, 1950 NO. 11

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DATES TO REMEMBER

SEPTEMBER 11-23: 6th Educational Graphic Arts Exposition, International Amphitheatre, Chicago, Ill.

SEPTEMBER 13-15: Second Testing Division Conference, Eastman Kodak Co. plant, Rochester, N. Y.

SEPTEMBER 14-16: Southern Paper Trade Assn., Sheraton Plaza Hotel, Daytona Beach, Florida.

SEPTEMBER 14-17: American Pulp & Paper Mills Supts. (New York-Canadian Div.) Convention, Chateau Laurier Hotel, Ottawa, Ont., Canada.

OCTOBER 2-4: American Management Assn. National Conference on Personnel Problems of Industrial Mobilization, Hotel Statler, N. Y.

OCTOBER 2-5: Fifth Engineering Conference of the Pulp and Paper Industry, Netherland Plaza Hotel, Cincinnati, Ohio.

OCTOBER 11-13: Fifth Annual Symposium on "Instrumentation for the Process Industries," Agricultural and Mechanical College of Texas, College Station, Texas.

OCTOBER 12-14: American Pulp & Paper Mills Supts. (Southern and Southeastern Div.) Annual Meeting, George Vanderbilt Hotel, Asheville, N. C.

OCTOBER 16-20: 38th Safety Congress and Exposition, Chicago, Ill.

OCTOBER 23-25: National Paper Trade Assn., Fall Convention, Stevens Hotel, Chicago, Ill.

OCTOBER 25-27: Alkaline Pulping Conference, George Washington Hotel, Jacksonville, Fla.

OCTOBER 30-31 NOVEMBER 1: 37th National Foreign Trade Convention, The Waldorf-Astoria, New York, N. Y.

NOVEMBER 2: Instrument Society of America, Hotel Bellevue-Stratford, Philadelphia, Pa.

NOVEMBER 27—DECEMBER 2: 19th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, N. Y.

DECEMBER 3-6: American Institute of Chemical Engineers, Annual Meeting, Neal House, Columbus, Ohio.

THIS WEEK

An unusual but very modern mill in the Philippines is interestingly described in "Fine Paper Production from Bagasse" by F. G. L. Becker.

Valuable information on the usefulness of various materials for waterproofing masonry surfaces, as well as methods of evaluation of these materials, are contained in "Results on Testing Surface Waterproofing" by F. O. Anderegg.

A survey of a wide variety of papermaking materials from the standpoint of their economic possibilities is contained in "Economic Aspects of Papermaking Fibrous Raw Materials" by Dr. Louis T. Stevenson.

NEXT WEEK

"Corrosion In A Neutral Semichemical Pulp Mill" by L. W. Murtfeldt.

"Oil Holes and Grooves in Plain Journal Bearings" by S. A. McKie and H. S. White.

"Automatic Control of Dissolving Tanks."

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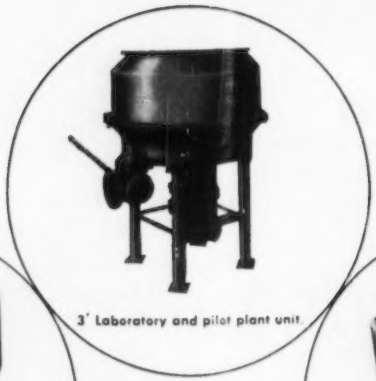
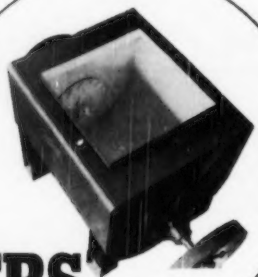


3' Laboratory and pilot plant unit.

Standard design with cast iron tub.

HH type unit for special locations.



HYDRAPULPERS GALORE

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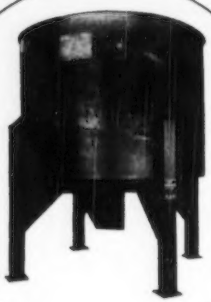

HC type unit for special locations.

Many designs. Many capacities. Fifty years experience in pulping, dating from breaker beater to Hydrapulper.

Something to meet any and every mill pulping and stock cleaning problem, deinking or color and chemical mixing need.

If it's pulping and cleaning of all kinds of paper stock it's Shartle *all the way*.

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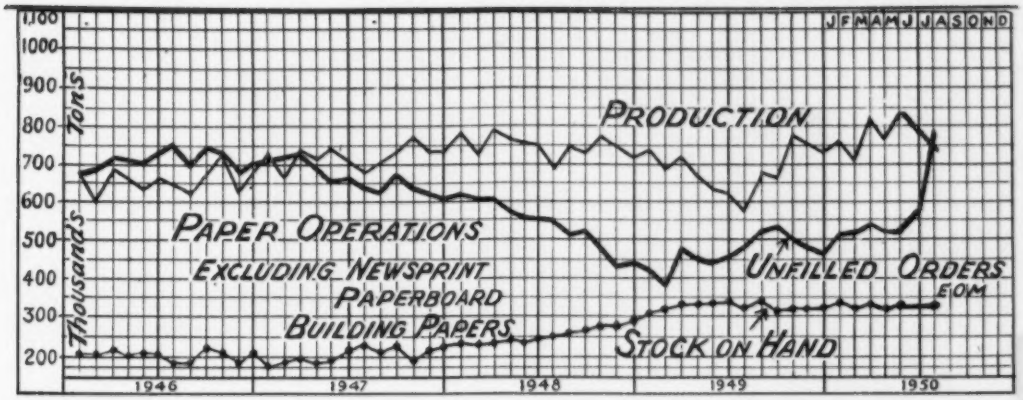
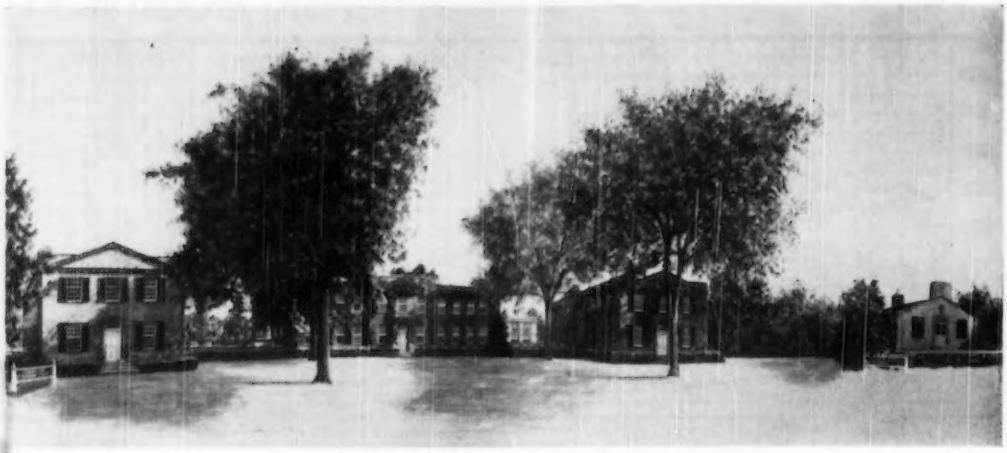
Weekly Brief of Important Figures

OUR BUSINESS



Source		WEEK ENDING Sept. 2, '50	Aug. 5, '50	Sept. 3, '49
APPA	Paper Production percent 6-day Capacity	106.2	106.5	89.3
	Unbl. Kraft Paper Production percent	94.2	99.1	76.5
NPA	Paperboard Operating Ratio percent inch hours	100.0	98.0	89.0
		July 1950	**June 1950**	**July 1949**
APPA	Paper Production* (Except Newsprint and Building Papers) ..... Tons	748,000	788,500	555,000
	New Orders ..... Tons	957,000	812,800	589,000
	Unfilled Orders ..... Tons	775,090	565,565	368,365
	Shipments ..... Tons	745,000	786,300	566,000
		August 1950‡	**July 1950**	**August 1949**
NPA	Paperboard Production ..... Tons	1,130,242	745,255	821,600
	New Orders ..... Tons	1,365,968	890,890	890,200
	Unfilled Orders ..... Tons	729,058	524,391	365,600
	Our Customers Activities Index[1]	**Latest Mo.°**	**Previous Mo.°**	**Year Ago°**
FRS	Manufactures Total Index	209	203	176
	Durable Mfg. Index	238	232	195
	Nondurable Mfg. Index	184	180	161
	Chemical Products Index	259	255	230
	Mfg. Food Products Index	164	157	165
	Printing and Publishing Index	169	169	148
ODC	Magazine Advg.-Printer's Ink Index	321	324	314
	Retail Sales Combined Adjusted Index	316.2	313.0	300.9
	Drug Index	215.4	215.9	225.3
	General Merchandise Group Index	306.6	300.5	293.1
	Grocery and Combination Index	379.2	379.1	358.1
	Prices Index			
BLS	Consumers Price Index[1]	170.2	168.6	169.6
	Wholesale all Commodities[2]	157.3	155.9	154.5
	Wholesale Foods[2]	162.1	159.9	162.4
	Commodities other than Farm Products and Foods[2]	148.8	147.6	145.5
	Wholesale Pulp and Paper[2]	155.4	155.4	159.6
	Purchasing Power of Dollar, Consumers Prices[1]	58.8	59.3	59.0
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	349.0	337.2	312.8
	Unemployment Compensation Initial Claims (M)	1,104	1,367	1,522
	Miscellaneous Carloadings–Thousands of Cars	1,846	1,424	1,637
	Electric Output (Million KW hr.)	31,608	31,486	28,025
PTJ	Average 32 P & P Common Stocks as of August 29	$32.35	$29.96	$26.20
	Average Indicated Dividends Common Stocks as of August 29	$ 2.32	$ 2.32	$ 2.23

[1] 1935-39=100 Unadjusted Index
[2] 1926=100
* For details see APPA Monthly Statistical Summary—June 1950 Estimated Figures
° Latest Month Available on Request
‡ For Five Weeks



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For Testing and Developing
Methods of Improving
Paper Products

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 13, 1950.

Not so many years ago, it used to be said that everyone needed a hobby — some physical or mental activity for leisure hours that would be complete diversion from daily work. The man who could drop business cares for engrossing sports, gardening or other skills, study, reading, etc., was held to be in better balance than one who could not let go. His values were more rounded, his temperament more resilient, his humor more responsive. In short, a man with a hobby was likely to be a "well-integrated personality" who didn't take himself too seriously, had a keen sense of direction, one who was able to meet an emergency and to laugh at its ridiculous elements.

Judging from our upside-down world, one wonders if that generation of hobbyists chose to retire from business and politics. Notably missing from world and market affairs is agreement on values; and without values there can be no set to direction.

Torquay Set For Talkie

This confusion about values and direction was denounced by a Canadian writer in an analysis of the proposed tariff meet at Torquay, England, on September 28. Delineating in sharp blacks and whites the probable outcome of "the highly sterilized gathering of highly sterilized economists," the writer proposes that we "get together on what we are fighting for, or what we are planning to do with a pacified economy; what we hope to make of tomorrow, and the day after and the day after that. Torquay, right now, makes little sense," says the *Financial Post* columnist.

Despite the presentations of various trade groups for a cancellation of the Torquay negotiations, the U. S. Department of State has formally announced that the third round of tariff negotiations will go forward as planned. Replying to requests that the meet be called off because of the Korean war, the State Department made clear its position that the Korean situation has increased rather than diminished the necessity for furthering close cooperation in Western Europe.

The line of direction as seen by the Canadian writer is that: "Torquay is definitely subsidiary to the greater planning of an Atlantic community, restricted in membership as far as possible to make for greater cohesion — which will require a pooling of resources, of talents, of energies and will-powers. Wrangling over concessions on a limited line of consumer goods indicates that there as yet is no desire to bring about that pooling. . . . I think we should realize that what we are doing is done for a great many reasons: some are fighting to make the world safe for the spirit of 1912, some to make the world safe for capitalism, some to make the world safe for their own kind of socialism. . . . The degree of enthusiasm with which they engage in the common economic and political struggle depends solely on what each thinks he is trying to salvage."

Until we know what we want to make of tomorrow, the writer states, "Torquay is only a gathering of interior decorators wrangling about the wallpaper in a house that may never, never be built."

Scandinavian Pulp Prices

"There should no longer be room for pretense," says the same writer. "The world is a much more crooked place than has been admitted."

Things may be either "crooked" to you or twisted out of proportion, depending on your philosophy, your nerves or your digestion. At a time when U. S. State and Commerce Departments are going all-out for the trade gathering at Torquay, it is understatement to say that the proposed rise of $35 a ton in Swedish pulp prices are non-cooperative. U. S. consumers speak cynically of Swedish desire to hold this market and of their need for U. S. dollars. Their line of reasoning would take some defense to U. S. mills and taxpayers, it is stated.

Finnish prices are yet to be decided. It is expected that they will be considerably higher. Reports of the strike of woodworking industries which started on September 2, and of the announced walkout of woodpulp workers for September 20, are looked upon by the trade as prelude explanations to *reasonable* price rises. Also announced to U. S. contract customers is a sizable cutback in Finnish pulp commitments.

Waste Paper Prices Defended

There is no weakening in waste paper prices from August highs. To the contrary, some rises are reported on hard whites and new kraft cuts. (See *Prices* page.) In view of higher fourth quarter prices for wood pulps, world shortage of virgin pulp stocks, low inventory position and capacity production at consuming mills, there is seen small likelihood for easing from today's highs.

Conceded is slight softening in low grades as the Autumn collections gather volume late this month. Some anxiety also was expressed that prolonged strikes at principal New Jersey board mills which started August 31 might halt buying operations and weaken the market position of these grades.

Today's prices, though seemingly out of line in their sudden rises from spring lows are justified by the trade press and by dealers. "Last year and early this year when waste paper went begging, when prices dropped so low that it did not pay to collect the paper, the consumers showed no concern," the *Waste Trade Journal's* editor writes. "It is true that waste paper prices have advanced sharply in the past two months, but it is important to ask from what level they advanced. After a mill has been accustomed to get the material for almost next to nothing and then has to pay a price that will at least cover the cost of collection and leave a small margin of profit for the collector and dealer, of course the advance looms large. Had waste paper been selling at a reasonable price level, the present price would probably still be where it is, but the rise would not have been considered drastic or sharp. It must be evident that what the mills are now trying to do is to start a flow of waste paper so that the collectors and dealers will be deluged with it and then the mills will graciously step in and buy it once more at their own price," says Editor S. B. Wakesberg.

The plight of waste paper dealers during the market glut of 1949 was well-publicized in this column. Quoting from *Trends* of January 26, 1949, when the writer had climbed into a Front Street warehouse to cover an East Side packers' meeting:

"The glut of *mixed paper* in the N. Y. area has reached colossal proportions with high freight costs making shipments prohibitive. Warehouses bulge nor leave even stepping space; trucks carry a continual flow to dumping areas for burning; and more waits at stores, offices and industrial buildings to be collected in order to maintain contracts." Hardest hit by the prolonged market weakness were World War II veterans whose GI investment vanished in business losses.

There doubtless are rights and wrongs in pricing; it all depends on where one stands. During OPA days, there was an approved $5 per ton conversion cost over dealer buying prices, based on a minimum wage of 40c. With today's wage minimum set at 75c, that cost alone is nearly doubled.

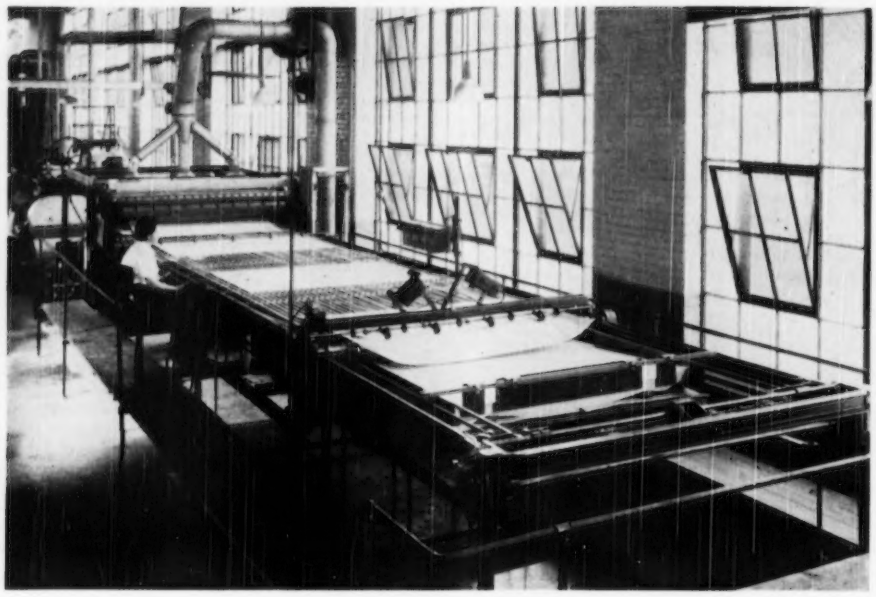
Some prices appear to respond to factors of supply and demand, notably the pulp substitute grades. It is in the low bulkies that the sudden rises and plunges come. More stability, more fair trade practices would please mills and dealer alike.

— E. P. N.

Paperboard Production (Tons)*

	Sept. 2 1950	Aug. 26 1950	Sept. 3 1949	Month of Aug.
Production	229,360	228,119	193,515	1,136,242
New Orders	317,217	211,023	262,601	1,365,968
Unfilled Orders	729,058	643,496	565,609	729,058

Source: NPA.



SAVE MONEY ON YOUR SORTING

IN OUR opening announcement of New Cutter-Sorter we now Cut, Sort and Count and save all seconds at running speed up to 250 ft. per minute.

Each sheet is stopped before girl to sort. On 2-side sorting we use two girls and special lights, girl sorter looking directly into sheet under side.

Our engineers build this precision unit with same engineering exactness printing press building takes—high speed and good production over the years. Our air stop for each sheet to be scanned by girls, together with special lighting produces easy going sorting with no wounding of sheets. This unit is intended and was designed for finishing rooms who manually inspect each sheet. Range of unit is up to 104" wide rolls and a long grain cut up to 78". With slitter if wanted.

Practically every manufacturer either consciously or unconsciously engages in applied research. His main objectives are to lower manufacturing costs, improve product quality, and develop new products. The very nature of our competitive system requires him to aim at these objectives in order to stay in business.

We invite your engineering department to make estimate of economies that can be effected mechanically—two shifts will give a quicker return and more tonnage.

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News of the Week

Yorktowne Buys Procel

EAST PALESTINE, Ohio—The Yorktowne Paper Mill Corp. of York, Pa., took over the operation of the Procel Co. on August 21, William M. Martin, superintendent, announced.

Mr. Martin, head of the company for eight years, said the deal for the purchase of the local company was closed the week of August 15.

The present company began operation in 1943 as the East Palestine Paper Products Co. and a year later the name was changed to the Procel Co. Prior to 1943 the T & H Enterprise Co. operated an experimental paper mill in the building.

The new owners will operate as the Procel Corp. and will be incorporated under Ohio laws with Howard J. Sparler vice-president and Milton V. Oakley treasurer.

New Firm Buys Saugerties Mill

SAUGERTIES, N. Y. — The newly formed Ulster Co. Paper Mills, Inc. recently purchased from the Saugerties National Bank & Trust Co., the former Sheffield Paper Mills, located on East Bridge street. The company has been readying the plant for production of tissue paper products. It is expected that the company will employ about 47 men when they start operations.

National Container Plans Expansion

National Container Corp. announced September 7, the company had authorized an expenditure for capital account sufficient to increase the production of its Pulp Kraft & Board Mills by about 5 percent in Florida, Michigan and Wisconsin.

Wisconsin's Highway Problem

WASHINGTON, D. C.—The Wisconsin lumber industry, through accredited representatives, has raised a question with Wisconsin legislature as to whether state highways should be built for the expected traffic, or the traffic regulated to conform to the highways.

The pulpwood carriers pointed out that while present law permits heavier winter loads because the roads are frozen, the State Highway Commission has seemed reluctant to grant the necessary formal authorization. Carriers are urging axle weight limits of 23,000 pounds from December 1 to March 15, with 28,000 pounds gross weight per vehicle, compared with existing general limits of 19,000 in the state.

Hubbs & Lindenmeyr Unite

Form New Corporation

RICHARD C. KETTLES, JR.

CHARLES J. SLICKLEN

GEORGE F. GRAY

Officials of Charles F. Hubbs & Co., industrial and specialty paper merchants since 1855, and Henry Lindenmeyr & Sons, fine paper merchants since 1859, announce completion of a long planned consolidation, uniting all facilities of the two companies. This has been accomplished by the formation of a new corporation, namely, Hubbs Corp. This move is the first in the merging with Hubbs Corp. of several other companies.

The consolidation of Hubbs and Lindenmeyr joins the facilities, resources, and long experience of these two well known firms. The long established firm names of Henry Lindenmeyr & Sons, and Charles F Hubbs & Co. will be preserved, as the two companies will continue operations in their respective fields as Divisions of Hubbs Corp. Eventually all warehousing, receiving and delivery will be from one location.

The new corporation, through this consolidation, will have branches and warehouses in New York, Mineola, and Cohoes, New York; in Newark and Trenton, N. J.; in Bridgeport, New Haven, and Hartford, Conn., and in Boston, Mass. All officers and personnel continue as before.

At the time of this release, and in view of future mergers to follow, only three officers of the Hubbs Corp. have been elected: Richard C. Kettles, Jr., president, and president of Charles F. Hubbs Co. Division; Charles J. Slicklen, vice-president, and executive vice-president of Charles F. Hubbs Co. Division; George F. Gray, treasurer, and president of Henry Lindenmeyr & Sons Division.

The present board of directors will consist of the above named officers and also Elmer E. Cole, vice-president of Henry Lindenmeyr & Sons.

Ask Torquay Conference Cancellation

Due to the international situation, a group of industries has requested the Government to postpone tariff negotiations at Torquay, England, the latter part of this month. At the recent meeting of the Association's Executive Committee, the A. P. & P. A. was authorized to join in this protest. It was felt that further tariff reductions should be barred for the duration of the national emergency.

Fighting Paper Wanted

Invitation for Bids has been issued by the New York Quartermaster Procurement Agency, 111 East 16th Street, New York 3, N. Y., on QM-30-280-51-273, covering Items 1, 2, 3 and 4—Paper Manifold, Sub. 9, 25 percent rag, (Various colors, size 8"x10½"), 17,470 reams; and Items 5, 6 and 7—Paper, Manifold, Chemical Wood, Sub. 9, (various colors, 17"x28"), 9,650 reams. Bids will be opened October 5, 1950, at 11:00 A.M. (EST) at the New York office. Delivery schedule: To be completed by November 30, 1950. This procurement is for the U. S. Navy.

QM-30-280-51-285, covering Items 1 and 2—Paper Mimeograph, 25 percent Rag, Substance 20, Sizes 8"x10½" and 8"x13" (color white). 15,000 reams; Items 3, 4, 5, 6, 7, 8, 9, and 10 — Paper, Mimeograph, Chemical Wood, Substance 20, sizes 8x10½"; 8x13", 17x22", and 17x28" (various colors), 8,800 reams. Bids will be opened October 6, 1950, at 11:00 a.m. (EST) at the New York office. Delivery schedule: To be completed by November 30, 1950. This procurement is for the U. S. Navy.

QM-30-280-51-253, covering Item 1—Paper, Index, Bristol, Single ply, stiff, heavy paper, 50 percent Rag, Cotton or linen fibers, remainder Chemical wood, Bleached, Tub sized, Substance 110, color—white. Size 22½x28½", 55,510 sheets; and Items 2, 3, and 4, Paper, Index, Bristol, Single ply, Chemical Wood, Bleached, Rosin sized, Substance 110 and Substance 140, Colors—white and green; sizes 22½x28½", and 25½x30½", 1,035,000 sheets. Bids will be opened October 2, 1950, at 1:30 P.M. (EST) at the New York Office. Delivery Schedule: To be completed by November 30, 1950. This procurement is for the U. S. Navy.

QM-30-280-51-254, Item 4 — Paper, Wrapping, Kraft, 36" Wide, 9" Diameter, Roll Form, 24x36-500/40 lb. Basis, 2,400 rolls.

Bids will be opened September 29, 1950, at 3:30 P.M. (EST) at the New York Office. Delivery Schedule: One-half by December 31, 1950; ½ by January 31, 1951. This procurement is for the U. S. Marines.

QM-30-280-51-255, covering Paper, Stencil, Duplicating Machine, Waxless, Dry Process, Cellulose, Blue, 8½x18, 20,000 quires. Bids will be opened October 2, 1950, at 1:00 P.M. (EST) at the New York Office. Delivery Schedule: November 30,—December 31, 1950. This procurement is for the U. S. Army.

QM-30-280-51-260, covering Paper, Duplicator, Liquid Process, Chemical Wood, White, Green and Yellow, Sub. 20, sizes 8x13", 8x10½", 8½x14", and 22x34", 35,875 reams. Bids will be opened October 3, 1950, at 1:30 P.M., at the New York Office. Delivery Schedule: To be completed by November 30, 1950. This procurement is for the U. S. Navy.

JAMES A. WILLIAMS

Potlatch Names Williams

James A. Williams, formerly vice-president of Bonestell & Co., paper jobbers of San Francisco, Calif., has been named sales manager of the pulp and paper mill of Potlatch Forests, Inc., according to an announcement by William P. Davis, president of the corporation. The appointment was effective August 1.

QM-30-280-51-247, covering Paper Blotting, Desk, Color Blue, Chemical Wood, Sub. 100, Finish well-rolled and firm, size 19x24", 80,000 sheets. Bids will be opened October 2, 1950, at 11:00 A.M. (EST) at the New York Office. Delivery Schedule: to be completed by November 30, 1950. This procurement is for the U. S. Navy.

QM-30-280-51-171, covering Fiberboard, Nonwater-Resistant, Corrugated, 10,000 sheets. Bids will be opened September 20, 1950, at 1:00 P.M. (EDST) at the New York Office. Delivery Schedule: To be completed by October 31, 1950. This procurement is for the U. S. Navy.

QM-30-280-51-172, covering Paper, Bond, Chemical Wood, Substance 13, Tubsized, Size 17"x22", Color, Green, 770 reams. Bids will be opened September 21, 1950, at 1:00 P.M. (EDST) at the New York Office. Delivery Schedule: To be completed by October 31, 1950. This procurement is for the U. S. Navy.

QM-30-280-51-184, covering Paper, Sheathing, Fire-Resistant and Water-Repellent, Width, 40", Sq. Ft. Per Roll, 750, Weight 56 Pounds per 1,000 sq.ft., 201 rolls. Bids will be opened September 20, 1950, at 2:00 P.M. (EDST) at the New York Office. Delivery Schedule: To be completed by October 31, 1950. This procurement is for the U. S. Navy.

ECA Procurement Authorizations

WASHINGTON, D. C. — Substantial procurement orders for paper and related products for Belgium-Luxembourg, and Korea, were among ECA authorizations announced recently.

Included were $250,000 for Belgium-Luxembourg, and $140,000 for Korea, both exclusive of any newsprint. Paper for Korea will be obtained in Japan, and for the two European beneficiaries, from the U. S.

G.S.A. Limits Federal Inventories

The General Services Administration last week clamped a limit on all Federal inventories and buying, and told non-defense departments to work down stocks on hand before further purchases were made. Only the Defense Department was exempted from this order, but was asked to consider a similar move. Eleven specific items were considered critical, and agencies were told to be careful about using them. The articles listed were: aluminum, cement, copper, lead, leather, lumber, paper, rubber, steel, wool and zinc.

Paper and Board on Export List

The Department of Commerce announced last week that the following paper and board items would now require a validated export license, effective September 1, except if shipped to Canada: capacitator tissue, battery board, wet machine board, and laminated waterproof paper.

Canadian Imports of Paper

OTTAWA—Canadian Government announces imports of paper into Canada increased to $1,922,000 during June compared with $1,685,000 in June a year ago and reached a cumulative total of $10,973,000 in the first six months of 1950 against $10,015,000 in the corresponding period last year. Imports of books and printed matter also advanced to $3,247,000 in June this year compared with $2,668,000 a year ago June and totaled $20,237,000 in first half of 1950 against $16,082,000 last year in the same period.

No figures on quantities are disclosed in this official report.

Government Printing Paper

Government printing paper requirements and procurement problems were informally discussed recently in a meeting held at the Department of Commerce and attended by representatives of the Government and the printing paper industry.

The principal problem discussed was the difficulty being experienced by the Government Printing Office in obtaining supplies for the third quarter of 1950. Also discussed were estimated fourth quarter 1950 printing paper requirements of the principal Government claimant agencies: the G.P.O., General Services Administration, and the Department of National Defense.

Of total supplemental G.P.O. third quarter requirements for printing paper, amounting to about 4,000 tons, the G.P.O. has so far been able to receive bids on only about 750 tons, because of the deluge of orders from all sources which followed the Korean emergency.

Requirements of the three Government claimant agencies for the fourth quarter of 1950 were tentatively estimated at about 35,000 tons by the Department of Commerce on the basis of

requirements in previous periods. As the fourth quarter progresses this volume may increase above present estimates, and figures indicate that the requirements of Government agencies for the fourth quarter of 1950 may represent about 5 percent of the industry's projected production of the printing paper grades under consideration.

It was suggested that the G.P.O. attempt to obtain coverage on its current bids for the third quarter by directly contacting all printing paper producing mills, and that the G.P.O. should consider adjustments in specifications which would facilitate acceptance of its bids by the greatest number of producers.

The discussion resulted in the consensus that full acceptance of the Government's future requirements would be facilitated by advising all producing mills of the estimated volume and importance of the Government's needs. The industry representatives agreed to urge all mills producing printing grades to realize the critical situation which exists and to exert their best efforts to give priority to Government requirements.

Canada's Exports To U. S.

OTTAWA—Canadian Government reports exports of the following to the United States during the first half of 1950. The figures in brackets are for the corresponding period of 1949:

Woodpulp sulphate kraft bleached, 4,034,670 (3,184,253) cwt., $25,387,299 ($20,517,632); woodpulp sulphate kraft unbleached, 1,229,288 (1,207,069) cwt., $5,414,118 ($6,072,713); pulp sulphite bleached dissolving, 2,337,805 (1,736,188) cwt., $17,472,243 ($13,076,264); pulp sulphite bleached paper grades, 2,650,198 (1,987,452) cwt., $15,316,346 ($12,069,744); pulp sulphite unbleached strong, 2,132,567 (1,465,603) cwt., $10,087,269 ($7,989,360); pulp sulphite unbleached news grade, 740,351 (1,056,207) cwt., $3,542,947 ($5,819,601); woodpulp mechanical, 2,246,058 (1,726,441) cwt., $5,972,747 ($5,076,595); woodpulp nop., 308,062 (251,198) cwt., $1,925,893 ($1,590,563); woodpulp screenings chemical, 79,549 (61,143) cwt., $97,966 ($82,867); pulp screenings mechanical, 62,440 (82,865) cwt., $34,477 ($38,014); pulp and fibre wallboards, 43,238 (89,621) cwt., $215,342 ($488,288); pulpboard for wallboard, 238,869 (211,191) cwt., $927,791 ($844,670); paper board nop, 296,564 (343,893) cwt., $1,355,591 ($1,489,512); book paper, 175,971 (66,852) cwt., $1,259,603 ($401,421); newsprint, 46,487,170 (40,709,325) cwt., $226,816,956 ($181,066,340); wrapping paper coated, 2 (5) cwt., $33 ($76); wrapping paper kraft nop, 8,842 (6,426) cwt., $57,155 ($32,546); wrapping paper nop, 5,082 (10,894) cwt., $25,144 ($51,144); bond and writing paper uncut, 800 (1,022) cwt., $9,390 ($8,399); bags of paper, $1,800 ($281); boxes and cartons of paper, $14,453 ($90,485); hangings or wall paper, 764,721 (1,239,127) roll, $295,571 ($445,839); roofing and building paper, 170 (248) cwt., $514 ($678); newsprint paper mutilated, 322,778 (141,655) cwt., $898,808 ($490,581); waste paper nop, 174,592 (156,539) cwt., $309,149 ($219,292); handkerchiefs tissues of paper, $82 ($86); tissue paper, 111 (nil) cwt., $1,243 (nil); toilet paper, 4,846 (15,121) cwt., $44,278 ($137,658); writing paper nop envelopes, $8,647 ($1,104); paper nop, $29,849 ($10,456); manufactures of paper nop, $48,257 ($21,807).

Join Sorg Paper Co.

Sorg Paper Co. announces that the following men have recently joined its organization: Melvin A. Dawson, at right, formerly with the Sales and Products Development Department of Marathon Corp. is now product development specialist on converted products at Sorg's Sales Division. Theodore J. Watson, center, is sales representative in the New York territory. He was formerly general manager of southern operations for Hubbs & Howe Co., Greensboro, N. C. Allison C. Clough, Jr., at left, sales representative in the Pennsylvania territory was formerly district sales manager for the Gummed Products Co., Troy, Ohio.

Gottemeyer and Spodt on Sales Staff

SYRACUSE, N. Y.—United Board and Carton Corp., Syracuse, has named Warren J. Gottemeyer and Carl R. Spadt to the carton sales staff. Both men will attend the company's three months sales training course before they are assigned to sales territories.

Baker Called To Active Duty

BERLIN, N. H.—Colonel Albert S. Baker, recently appointed by President Whittemore to Brown Co.'s Public Relations Division, has been called to active duty as Commanding Officer of the 197th Anti-aircraft Artillery Group of Concord.

Lift Import Restrictions

OTTAWA — Due to the improvement in the U. S. dollar position, the Canadian Government has announced the following in the pulp and paper products field have been taken off the prohibited list of imports from the U. S., effective October 1.

Paper sacks or bags of all kinds, printed or not (but not including those made from twisted paper); playing cards, in packs or sheet form, n.o.p.; cards and sheets partly lithographed or printed, for the use in the manufacture of such playing cards; cups, dishes or plates, forks, spoons, and drinking straws, made of paper, cardboard, or of vegetable fibres; paper envelopes, correspondence and printed letterhead papers, not including plain unprinted typewriter or copying papers; creped tissue paper and manufactures thereof; wrapping paper (including box covering paper and wrappers) printed, embossed or otherwise decorated; Christmas seals, stickers, tags and enclosure cards, printed, embossed or otherwise decorated; card and other games, score reckoners, score pads, tallies and place cards, of paper or cardboard; festivity, carnival and celebration supplies and decorations of paper or cardboard, including costumes, hats, caps, headbands, masks, horns, serpentines and confetti; blank books; photograph mounts manufactured from paper or paper board; tarred paper and prepared roofings, sheathing, etc., including corrugated board and all other similar boards manufactured wholly or in part of vegetable fibres (not including electric insulating board, match stem stock, shoe board, automobile board, bookbinders' board and pressboard); bristol board, artists' board, photograph mounting board, picture matting board and showboard; flock coated board or paper; wax coated paper; blotting paper not printed; acoustical wallboards, acoustical pads and acoustical tile of all kinds; wrapping paper of all kinds, not pasted, coated or embossed; paper and paperboards or fibreboards the surface of which is in two or more colors or is embossed or otherwise decorated; empty containers wholly or partially manufactured from paperboard having affixed thereto paper the surface of which is in two or more colors, or is embossed or otherwise decorated.

Imports restrictions are also eased on pictorial post-cards, greeting cards and similar artistic cards or folders finished or unfinished; paper hanging or wall papers, including borders or bordering. In addition, the report states that sand cast rolls and chilled cast iron rolls, for use exclusively in manufacturing paper, will be allowed into Canada from the U. S. without import controls after October 1.

Fine Paper Production from Bagasse

F. G. L. BECKER[1]

At Bais Central in the Island of Oriental Negros in the Philippine Republic a unique pulp and paper mill restarted in 1949 following the Japanese occupation. This mill is the only one in the world regularly producing fine printing, bond, and typewriting papers on a commercial scale using only sugar-cane bagasse as basic raw material. As such it claims the interest of paper-makers the world over.

The mill was originally started up in February 1941 following 5 years of work by the Compania General de Tabacos de Filipinas and the Central Azucarera de Bais. Saleable paper was produced within 24 hours of starting up the pulp mill, and during the few months that the mill was running prior to the Japanese invasion, the banknote and bond papers produced, containing not more than 10 per cent of imported wood pulp, were sold to the Philippine Government and none was rejected. After some 1,500 tons of paper had been produced, the arrival of the Japanese caused a cessation in the supply of bagasse, and it was not possible to resume production until April, 1949.

The pulp mill is continuous throughout and employs the Celdecor-Pomilio soda-chlorine process. The principles of this are now well-known and consist of the use of elemental chlorine as a delignifying agent following mild pre-digestion. This continuous process comprises:

a) Digestion with weak caustic soda solution at 100°C. or just above.

b) Exposure of the digested spongy mass to moist chlorine gas at air temperature.

c) Treatment of the washed chlorinated pulp with weak alkaline solution, followed by washing.

d) Gentle bleaching with hypochlorite, in one or more stages.

General View of Mill—Cia. de Cellulosa de Filipinas.

The chemicals required are thus caustic soda, moist chlorine gas and hypochlorite solution, and these are all supplied to this mill by the first electrolytic plant in the Philippines, which is installed alongside the pulp mill. Thus the only chemical required is common salt, apart from a little lime for bleaching: Incidentally, commercial hydrochloric acid and hydrogen are produced as useful by-products. Salt is obtained from the sea.

Some details of the installation in the Philippines mill are as follows:

Raw Material Preparation

The bagasse as discharged from the sugar mills is compressed into bales approximately 12″ x 12″ x 20″ by specially designed balers; it is then stored and allowed to dry out from the initial consistency of 50 per cent up to a normal air-dry state. The dried bales of bagasse are then disintegrated, and a considerable quantity of unwanted matter is separated and can be burnt in the steam boilers. The cleaned and dusted bagasse fibre is then passed to the pulp plant.

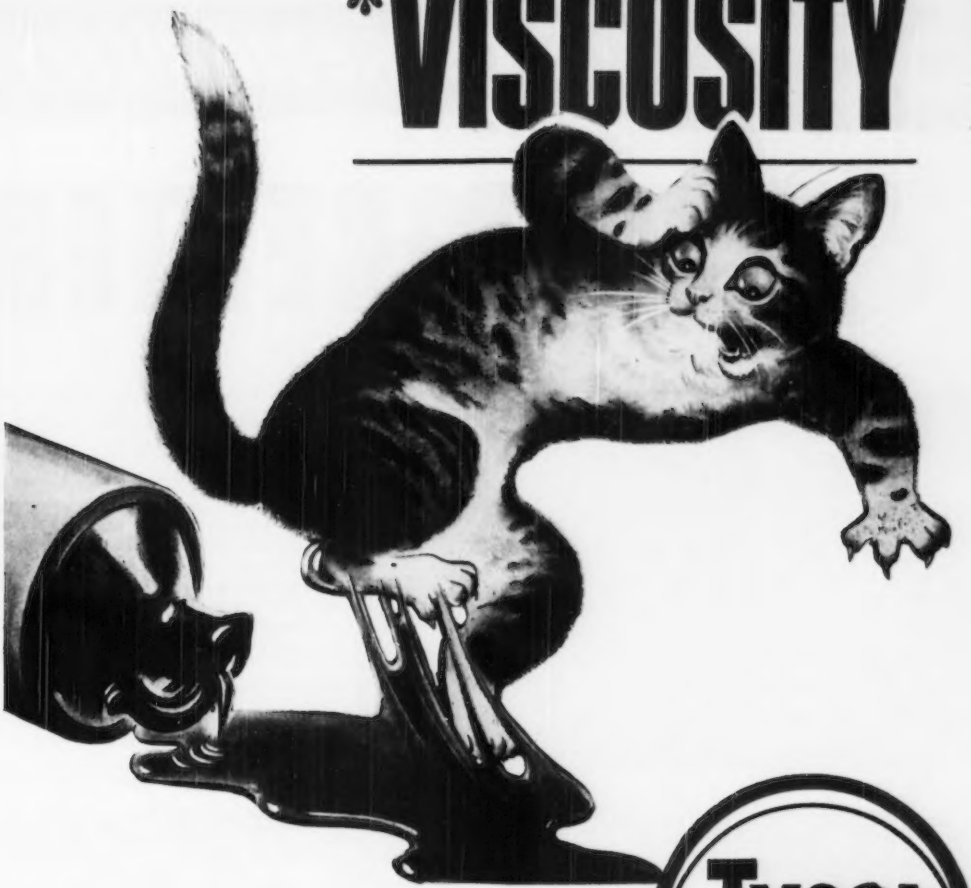
Pulp Mill

Following dusting, the bagasse falls into a dosing and mixing machine where it picks up the required amount of dilute caustic soda derived from the electrolytic plant. The presoaked bagasse then enters two digestion towers of oval cross-section where digestion takes place at atmospheric pressure by the admission of low-pressure steam. When the bagasse reaches the foot of the towers, it is mechanically

Bagasse Pulp Mill Building and Paper Machine House at Cia. de Cellulose de Filipinas, Oriental Negros, Philippines.

[1] Cellulose Development Corp., Ltd., London, England.

*VISCOSITY



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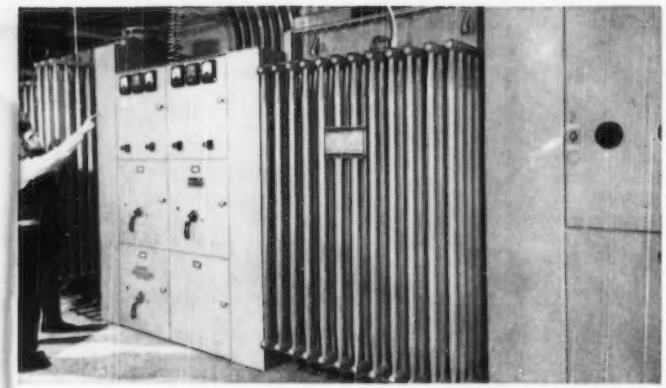
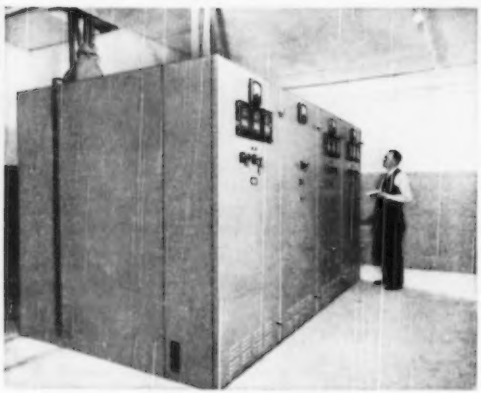
Scott GETS RELIABILITY

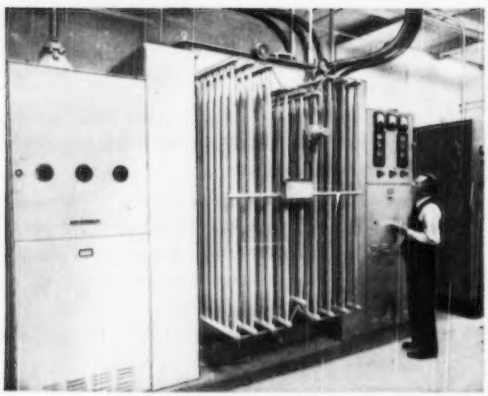
LOAD-CENTER



Double-ended load-center unit substation with 1500 and 1000 kva transformers. This unit receives incoming power at 13.2 kv and distributes it at 600 volts to steam plant auxiliaries and finishing equipment. Blades of air interrupter switch (right) are clearly visible through window, another safety feature of G-E unit substations.



R. E. Neilson, Electrical Superintendent of Marinette Paper Co., looks over the G-E 15-kv metal-clad switchgear that handles the 13.2 kv incoming power through three Magne-blast power circuit breakers. Metal-clad switchgear is neat in appearance, saving in space, and offers operating safety to personnel. Additional sections can be added for future expansion with a minimum of bother and expense.



General Electric 1500 kva load-center unit substation that supplies power to No. 4 paper machine. Air interrupter switch on the primary is easy to operate, blades are easy to see. Air circuit breakers on the low-voltage side are rated 1600 amperes, have plenty of "IC" (Interrupting Capacity) to handle all short circuits. Note entire load center is metal-enclosed, thus offering operating safety to personnel.

PLUS FLEXIBILITY WITH ···

UNIT SUBSTATIONS

"We can't afford to take chances with an inadequate power system because a breakdown would mean a major loss in both production and time. Our General Electric power-distribution system gives us the reliability and flexibility we need. If there should be a major fault we'd still be able to operate at slightly reduced capacity.

"The installation of this equipment was made without any trouble and we quickly changed over from our old system on a three-day weekend."

R. E. Neilson, Electrical Superintendent
Marinette Paper Co. (subsidiary of Scott Paper Co.)
Ft. Edward, New York

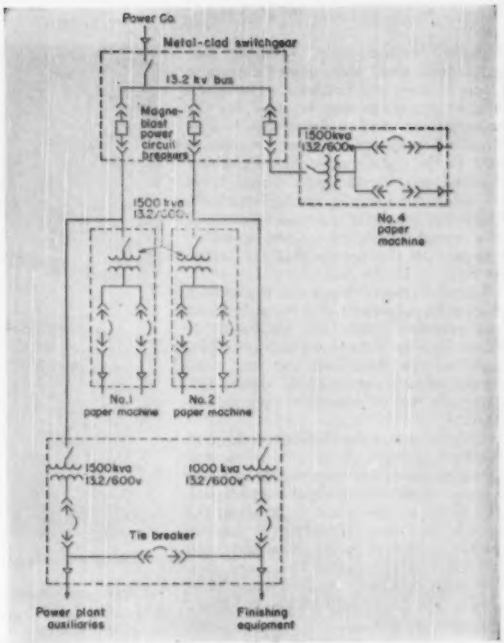
CHECK THESE FEATURES OF G-E LOAD CENTERS . . .

SAVE TIME by eliminating weeks spent over drawing boards detailing individual items. G-E factory-assembled unit substations are quickly and easily installed with lower material and labor costs than required for "piece-meal," makeshift affairs. No last minute "alterations" with hack-saws and cold chisels when you order G-E unit substations.

NEAT APPEARANCE Note the smooth, integrated appearance of these G-E unit substations . . . no more gawky, "old style" stovepipe connections between transformer and switchgear.

INVESTIGATE TODAY how General Electric unit substations can be used in your plant for efficient, flexible power distribution. Contact your G-E sales representative for further information, and write today for the helpful bulletins listed below. *Apparatus Department, General Electric Company, Schenectady 5, New York.*

GEA-3592 Load-center Unit Substations
GEA-3758 Load-center Power Distribution
GEA-3083 Metal-clad Switchgear



Here's the one-line diagram for Marinette Paper's Ft. Edward installation. The tie breaker on the double-ended unit substation makes it possible to shift the power supply in case of a primary fault, thus assuring continuous production at reduced capacity.

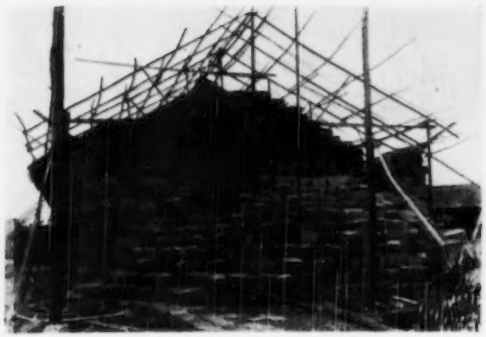
Metal-clad switchgear distributes the 13.2 kv incoming power to four G-E load-center unit substations where the high voltage is stepped down to 600 volts for utilization—right at the center of the load area. This eliminates long, costly secondary feeders.

The Scott installation is a complete General Electric project—one source of responsibility plus the very best in co-ordinated planning, engineering, manufacturing, and service facilities to give maximum savings and efficiency to the customer.

Be sure to see the "More Power to America" full-color sound slide-film "Modern Industrial Power Distribution." Ask your G-E sales representative to arrange a showing for your organization.

GENERAL ELECTRIC

Salt Storage.

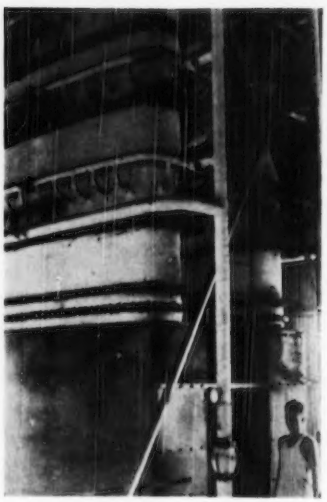


Bagasse Storage Showing Method of Construction.

extracted continuously, washed, partially dewatered and opened out in a specially designed machine. The semi-pulp at this stage may be used for the manufacture of wrappings. For bleached pulp production, it passes next to the chlorination towers, where chlorine gas is admitted direct from the Giordani-Pomilio electrolytic cells whilst the material descends the tower at a speed regulated by the speed of rotation of the continuous extraction mechanism at the base.

The chlorinated fibers are discharged to an acid pulp chest and water-washed in a pressure filter. The alkali-soluble chloro-lignins formed during gas chlorination are dissolved out in weak caustic soda solution in a tower, followed by further washing on a second filter.

This concludes the chemical treatment of the bagasse, which is now passed through coarse screens, sandtraps, fine screens and centrifugal separators. The stock at this point is at about 0.2 to 0.3 per cent consistency, and is thickened before being bleached with calcium hypochlorite in the usual way. The pulp is finally washed and delivered to the paper mill at about 5.5 per cent consistency.



Pomilio Continuous Digestion Towers

Paper-Making Plant

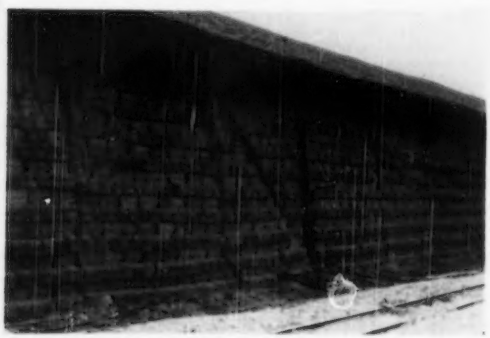
The pulp is treated in two Noble & Wood beaters, each holding 1200 lbs. of stuff, subsequently being finished in a Jordan before passing to the paper-machine headbox. From the headbox, the stock flows over a Bird Screen with submerged inlet feed before being delivered to the 92" Pusey & Jones fourdrinier paper-machine. This machine has a maximum speed of 500 ft. per minute and normally produces about 15 tons a day of high white lightweight bonds and writing papers. From the wire the stock passes over a couch roll of Downington design, of 22-inch diameter, and over the first, second, and third 18-inch diameter presses with 92-inch face, and finally to the dryers.

The paper machine has 3 dryer sections. There are 12 paper dryers and 3 felt dryers, each of the dryers having a 90-inch face. In addition to the paper dryers, there is one Yankee dryer, size 10-ft. diameter and 96-inch face.

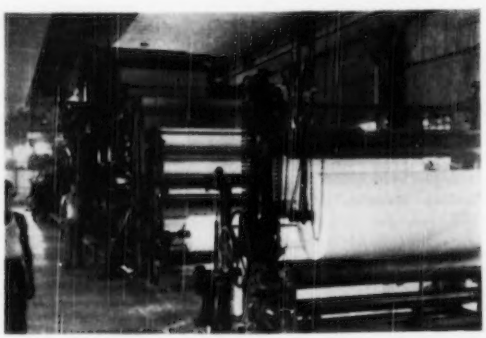
There is one calendar stock with 7 rolls and Vickery Hi-Flex Doctors. Also there is a two-drum upright reel with a 92-inch face, and a Cameron slitter and winder suitable for a maximum trim of 80 inches. The winding drums are 10½ inches diameter and 84-inch face. The winder operates at speeds up to 1,200 ft. per minute.

The paper is cut on a Hamblet single cutter, 80 inches trimmed width, equipped with 5 pairs of shear cut slitters, for varying sheet length from 20 inches to 70 inches.

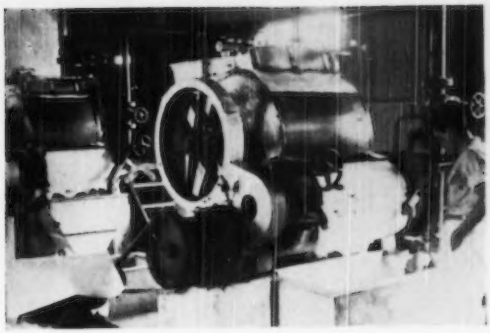
For the white-water recovery system, a Celdecor Sveen-Pedersen Saveall of the flotation type, having a capacity of 1,000 litres per minute, has been recently installed, depending upon



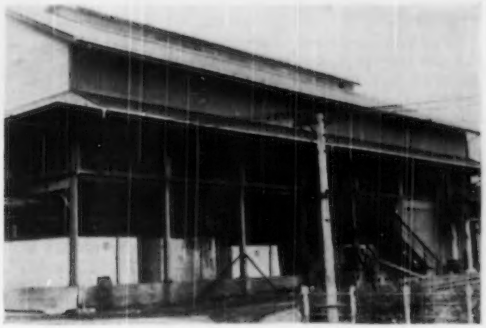
Bagasse Storage Showing Method of Arrangement to Permit Drying Out.



Pusey & Jones Paper Machine at the Mill of Cia. de Celulosa de Filipinas.



Bleach Pulp Wash Filters



Electrolytic Plant

chemical coagulation for efficient operation.

The yearly production of the mill is estimated at 5,000 short tons of paper containing 90 per cent to 100 per cent locally produced bagasse pulp.

Chipboard Plant

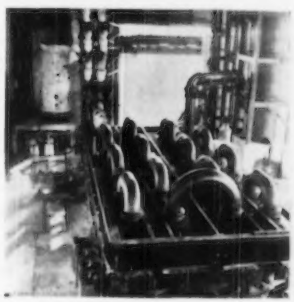
Paper-board or chipboard is manufactured on a cylinder wet machine, designed for a standard working width of 2,000 millimeters, ample for a capacity of 10 tons of board per 24 hours, produced as 90 per cent air-dry. Drying is effected in a S. F. Flakt dryer, with heat recovery unit for preheating of the fresh air supplied to the dryer.

Water Purification Plant

Purified water for the mill is supplied from the Tanjay river and delivered through a 6-kilometre pipe line of 14" diameter. Under normal operating conditions, it is stored in a coagulating and sedimentation basin, 165 ft. long and 35 ft. wide, with 10 ft. as the maximum depth. This water is filtered through six cylindrical pressure-type sand filters, giving a total filtration capacity of 300 sq. m. at a pressure of about 30 lbs. per sq. in. These filters work in parallel.

Steam and Power Plant

Water for the boiler is treated in a Rosseti feed-water softener by reaction of sodium carbonate and trisodium phosphate, with recovery of the alkaline boiler water. The total capacity is 6 cu.m. per hour. Steam supply amounts to 10,000 kgs. per hour and is produced from one Jonkopings Mek. Werkstad coal or oil automatically fired boiler, operating at 385 lbs. per sq. in., with a steam superheat outlet temperature of 425°C. The main steam supply for heating, drying and evaporating is by extraction from the turbine: should there be a greater demand of 43 lb./sq. in. steam than the turbo-generator can handle, the make-up is supplied by two auxiliary oil-fired boilers.



Hydrochloric Acid Plant (By-Product)

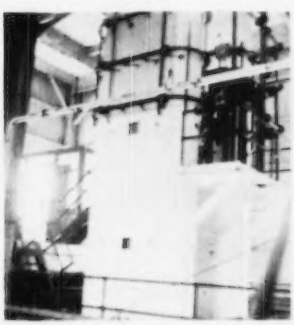
Electric power is supplied by a STAL reaction turbine, radial type, double rotation, operating at 3,600 r.p.m. The total output of the main generator is 1,500 KW at 480 V., 60 cy. and 1.00 power factor, while giving 4,500 kilos of steam per hour at 43 lbs. extraction. The turbine is equipped with a surface condenser and a condensed water cooling tower, size 4.5 m. x 6.6 m. high, with two V-rope drive blowers.

Power for the electrolytic cells is supplied by two D.C. compound generators, each 350 KW, 1,750 Amps., operating at 720 r.p.m., 50-200 V., with field rheostats and exciter. The synchronous motor of the ASEA converter group of 900 KVA, at 0.9 power factor, has an output of 700 KW at full load. Additional power is generated by an 805 HP Fairbanks-Morse Diesel engine with a 700 KVA G.E., A.C. generator and exciter.

General Facilities

The main office, the air-conditioned research and control laboratory and plant buildings, are contained in some 50,000 sq.m. of level ground, with railroad facilities and paved roads throughout the mill area. Space is provided in the compound of the Central Azucarera de Bais for housing most of the employees of the company.

A dental clinic and free medical services and hospitalization are provided for all employees.



Pomilio Gas Chlorination Tower

Towers for Bleach Liquor Preparation

Giordani-Pomilio Electrolytic Cells

Electrolytic Plant

Forty-two cells of the Giordani-Pomilio type produce from sea salt all the chemicals required for the manufacture of bleached pulp, with the exception of a little lime.

Brine made from salt obtained by solar evaporation is not free from calcium and magnesium compounds (sulphates, etc.). It is therefore purified by chemical treatment before using and filtered through an Oliver-Beatty radial leaf filter. To correct the alkalinity in the treated brine, electrolytic hydrochloric acid is added before pumping the solution to a constant-level tank, and finally to the individual cells through a float-feed system.

The plant could be modified to manufacture liquid chlorine when there is demand for this by-product, specially for water purification and textile bleaching.

Salt Recovery Plant

Concentration of the cathodic liquor from the cells is carried out in a double effect Swenson evaporator. The recovered salt is all re-used in the electrolytic plant, but it could be sold in the future as a table-grade salt, if market prices warranted it.

Bleach Liquor Preparation Plant

The bleach liquor required for the bleaching of the pulp is prepared from high-grade lime, using a small portion of the chlorine gas produced in the electrolytic plant. Two towers, each 1.0 m. diameter and 6.0 m. high, are built over the bleach liquor tanks provided with stirrers. From the bottom of the tanks, special Durco pumps send the milk of lime to the top of the bleaching towers. Sprayed from the top, the lime solution runs over internal baffles, meeting chlorine-gas entering from the bottom in counter-current flow. Towers are used in series to insure complete absorption and any spent gas is exhausted to the atmosphere.

The Cia. de Celulosa de Filipinas is a subsidiary of the Cia. de Generale de Tabacos de Filipinas, with the administration office at 212 Marques de Camillas, Manila. Mr. M. A. Rosales, M. I. Chem. E. (Philippines), is General Superintendent of the mill, and the facts given above are largely drawn from an article by him which appeared in the Philippines "Chemical Engineering Journal" of December, 1949.

The fact that this small mill—several hundred miles by sea from Manila—has been able to compete successfully in Manila itself with duty-free imported papers from America testifies both to the technical and commercial soundness of the making of fine papers from bagasse by this process. The papers made are fully equal in all respects to the corresponding imported types.

So far as is known, this is as yet the only mill in the world continuously producing fine papers from bagasse, but already there are other developments. In India, Rohtas Industries Ltd. are putting up a complete Celdecor-Pomilio bleached bagasse pulp plant at their paper mill at Dalmianagar, in Bihar province. This mill will have a capacity of some 20 tons per day of bleached pulp, and will incorporate all the improvements made during the last 10 years in the process and plant. The continuous digestion tower will be of a much improved circular design, providing for larger cooking capacity and higher temperatures. Heating will be indirect by means of steam-jackets, without direct steam. Washing and thickening of the pulp at various stages will be carried out on Celdecor-Paxman low-submergence vacuum filters, which have proved themselves extremely flexible and reliable in operation elsewhere. There is also a new and improved type of Celdecor gas-chlorination tower, although the basic principle of gas chlorination remains.

Another smaller unit is to be constructed in South India with equipment largely made in India, whilst one of the largest sugar producers in Brazil, Refinadora Paulista S.A., have signed a contract with Celdecor Africa Ltd., a subsidiary of Cellulose Development Corporation Ltd., for the erection of a complete bagasse pulp and fine paper mill in the State of Sao Paulo.

All these plants will operate the Celdecor-Pomilio continuous soda-chlorine process in its most up-to-date form, and point the way to a widespread supplementing of wood pulp supplies by this plentiful but hitherto little-used raw material.

A little-known point which emerges from the above is that the problem of profitably making high-grade papers from bagasse has been solved for more than ten years. The above plants are small by American standards, but the continuous process adopted, which is extremely economical in manpower is even better adapted to large-scale operations.

Results on Testing Surface* Waterproofings

F. O. ANDEREGG†

Synopsis

Methods of testing surface waterproofers reported at the 1948 Annual Meeting of the Society represent a phase of the investigations into masonry structures carried out over the past twenty-five years. These methods have now been employed in evaluating a much larger number of cement type and solvent system colorless waterproofers and have been extended to several emulsion waterproofers, to silicone resins, and to sprayed-on stuccos. Additional field studies have shown a good correlation with the laboratory results. Several of those previously reported continue to give excellent performance, while some members of the new types tested seem to show good promise. The greatest hazards seem to lie in the pressures developed by efflorescent salts, by rain erosion, and by oxidation.

It will be remembered that the author proposed the following definitions in a previous paper on "waterproofing" materials[2] by which, when the material is applied under proper conditions to suitable types of masonry, will prevent:

"1. Ingress of more than 1 lb. of water per square foot in the first hour under a head of ¼ in. water, and after one month or more of aging.

"2. Egress of visible moisture under a pressure, say, of 4 ft. of water from behind (at any time after the first month)."

A considerable number of additional materials including several new types, have been under test since that report. As a result a classification is proposed to cover their effectiveness in waterproofing, being based on the 72 hr. absorption per square foot under a ¼-in. head of water:

Grade A, below 0.2 lb.
Grade B, between 0.2 and 0.5 lb.
Grade C, between 0.5 and 1 lb.
Grade D, over 1 lb.

* Presented at the 1950 Annual Meeting of American Society of Testing Materials, Atlantic City, N. J., June 26-30.

† Director of Building Materials Research, John B. Pierce Foundation, Raritan, N. J.

[2] F. O. Anderegg, "Testing Surface Waterproofers," ASTM Bulletin, No. 136, January, 1946, p. 21 (TP 33). References to previous literature may be found in that paper.

The report of the American Concrete Institute Committee 616 on "Recommended Practice for the Application of Portland-Cement Paint to Concrete Surfaces." Journal, Am. Concrete Inst., Vol. 21, No. 1, September, 1949; *Proceedings*, Vol. 46, p. 1, has bearing on cement type waterproofers.

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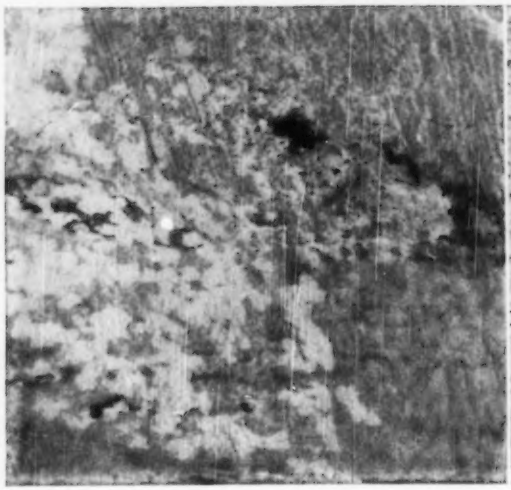


Figure 1.—Exposure through two winters has resulted in scaling.

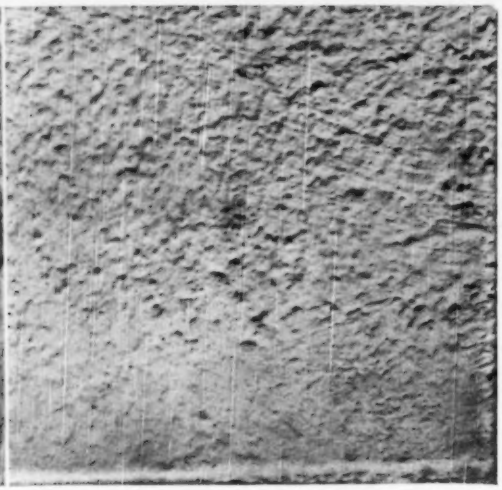


Figure 2.—Erosion of a material containing too little cement.

This classification affords a fairer means of grading waterproofing materials. Pending further investigation, this system of classification may serve for general use.

In addition, using the methods previously described, the effect of the waterproofing treatment on transpiration, on resistance to efflorescent pressure, and on weathering in the presence of soluble salts has been determined for two or more examples of each of five types of waterproofers.

The use of single bricks for making these tests, rather than going to brick assemblages, has been adhered to for the following reasons:

1. The far greater ease of making the tests with single bricks appreciably reduces costs.

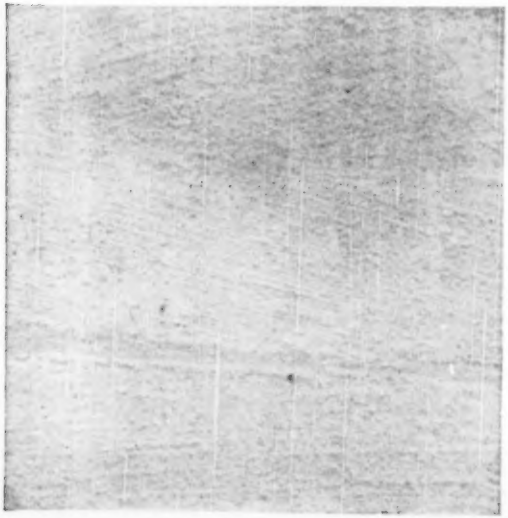
2. With proper care, bricks can be selected with pore openings which can readily be observed and measured, whereas the size of the openings between bricks and mortar in assemblages is very difficult to estimate. The results reported here were obtained with side-cut, stiff-mud bricks obtained from the lower part of the kiln. Those having some pore openings ranging from 1/16 to ⅛ in. were selected. When it was desired to note the ability of a given material to close the openings, bricks were chosen having cracks ranging up to 1/16 in.

Discussion of Waterproofers

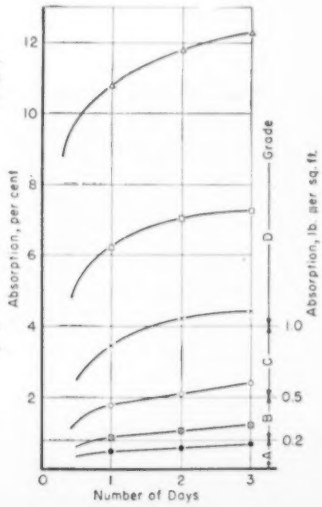
Cement-Base Waterproofer

These usually require rather hard manual effort to work them into the superficial pores at the wall surface, in order to replace all the air therein with the suspension. The suction of the base must be brought under control by proper wetting before making the application of most of the materials of this class while curing by proper wetting, especially in summer, is very important.

All four grades are represented in the cement-base materials tested, while the observed, fairly rapid transpiration rates of all tested are similar to those giving satisfactory service in the field. The best of these have resisted efflorescent action quite well, but almost all have suffered on exposure on the roof over the winter in the presence of sodium sulfate. Some scale off as shown in *Figure 1*. Others of low cement content may be eroded as in *Figure 2*, while others are self-chalking and continue to present a fairly clean surface *(Figure 3)*. Typical absorption data are found in *Figure 4*.



← Figure 3.—Slow Self-Chalking Has Kept This Surface Relatively Clean.



→ Figure 4—Cement Base.

Solvent Type Waterproofer

It is not difficult to formulate solvent type systems, especially when pigments are present, which will seal pores in masonry up to about 1/16 in. or even up to ¼ in. by increasing pigment concentration. Linseed oil has been painted on concrete surfaces for many years with rather good results. One of the limitations of vegetable oil vehicles lies in the danger of saponification by alkalies found so commonly in portland-cement structures.

But many oleoresins have excellent resistance to chemicals and light. Typical results for water ingress are included in *Figure 5*. Most of this type belong to grade A or B when freshly applied, but tend to degenerate gradually due to the action of the various effects involved in weathering, including efflorescent crystal pressure, oxidation, and preferential wetting.

Many oleoresinous films are rather low in water vapor transmission; in other words, they do not "breathe" very well. Any accumulation of soluble salts at the surface on which they have been painted will tend to cause the formation of water blisters by osmotic pressure. Since soluble salts are nearly always to be found in masonry and since alternate wetting and drying will tend to cause their accumulation at the surface, trouble of this sort is to be anticipated. *Figure 6* presents an example.

TABLE I.—EVALUATION OF SURFACE WATERPROOFERS

G = Good; F = Fair; P = Poor.

Identification Number	Absorption Class	Transpiration	Resistance to Efflorescence	Resistance to Weathering	Initial Appearance	Ease of Application	Cost of Application, Cents/sq. ft.
CEMENT TYPE							
A	D	G	F	F	G White	F	8
B1	D	G	F	F	G White	F	8
B2	D						
C	D	G	F	P	G White	F G	8
D	D	G	F	F	G Dark brown	F	8
E	C	G	G	..	G White	F	8
F	D	G	F	..	G White	F	8
G	D	G	F	F	G Yellow	F G	8
H	A	G	F	G	G White	F G	8
I	D	G	P	P	Uneven	P	8
K	A	G	F G	..	G White	F G	8
L	A	G	F G	G	G White	F	8
M	B	G	F G	G	G White	F	8
N	D	G	P	P	G White	F	10
O	C	G	F	F G	G White	F	8
SOLVENT TYPE—CLEAR							
A	D	F	F	F	Shiny	G	9
B	D	F	P	F G	Shiny	G	10
C	D	F	F	F	Slightly shiny	G	8
D	B	F	..	..	Shiny	G	9
E	D	P	P	P	Shiny	G	8
F	C	P	G	..	Shiny	G	9
G	D	F	P	P	Shiny	G	9
H	D	F P	F G	P	Shiny	G	8
I	D	P	P	P	Shiny	G	9
K	D	G	P	F	Shiny	F Sticky	9
L	A	F	F	F	Shiny	G	10
SOLVENT TYPE—PIGMENTED							
A	D	F G	F	F	White	G	10
B	D	F	F	F	White	G	9
C	A	F	F G	F G	White	G	10
D	B	F	F G	F	White	G	9
E	B	P	G	..	White	G	8
F	C	F P	F	..	White	G	8
G	B	F P	G	P	Gray	F G	8
EMULSION SYSTEMS							
A	B	G	F	..	Shiny	G	8
B	D	G	F	F	Shiny	G	8
C	B	G	F	F	Shiny	G	8
D	D	G	F	F	Shiny	G	8
E	B	G	..	..	Shiny	G	8
F	B	G	..	..	Shiny	G	8
G	D	F G	P	..	Shiny	G	10
SILICONES							
A	A	G	G	G	None	G	12
B	D	G	G	G	None	G	9
C	A	G	G	G	None	G	8
D	A	G	..	..	None	G	9
E	C	G	..	..	None	G	9
SPRAYED-ON STUCCOS							
A	B	G	F	F G	White	F	10
B	B	G	F	F	White	F	10
C	A	G	G	G	Glossy white	G	20

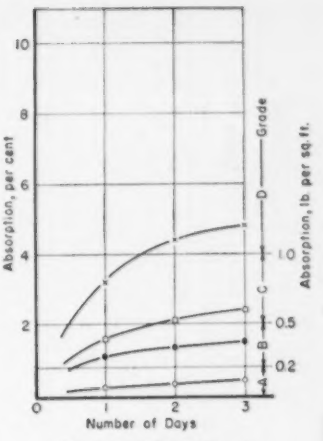


Figure 5.—Solvent Systems.

In certain types of wall, however, interior ventilation by means of cavities which are vented to the outside, either accidentally or systematically, may take care of the moisture so that films of poor transpiration characteristics may yet render good service. Concrete masonry houses have been very successfully painted with certain oleoresinous paints. These paints have the advantages of ease of application and good appearance. With the proper material, excellent durability can be secured in the paint film itself, when freed from the exfoliating forces of growing crystals or water blisters.

Emulsion Type Waterproofer

A number of resins, usually with plasticizers, such as polyvinyl acetate and polystyrene, are readily obtained as emulsions in water. They can generally be applied with ease to masonry, no prewetting or aftercuring being required. Some effort should be made to work them into the larger pores, and appropriate concentrations should

Figure 6.—Moisture and Soluble Salts Tend to Play Havoc with Solvent-Type Surface Treatments on Masonry.

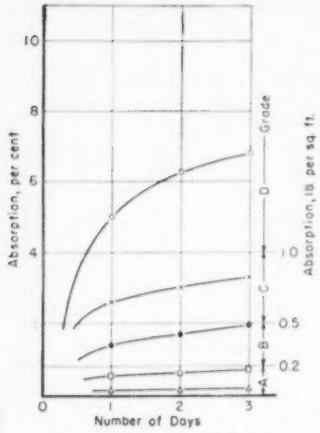


Figure 7.—Emulsions and silicones
Upper of our curves were obtained with emulsions, while the bottom curve represents the maximum obtained in these experiments with silicones.

be used. According to our studies, rather thin films, suitably plasticized to give a good degree of flexibility, are capable of giving good service.

Of course, if a driving rain should strike the wall before the films have had a chance to dry out, the films may be washed off. Some of the dried films have a slight tendency to "blush" or turn white when wetted, but soon become colorless on drying again. This property of blushing seems to diminish with age. Pigments help fill larger openings, but naturally change the appearance of the wall.

Emulsion films seem to be characterized by good breathing ability. They cannot be expected to withstand the forces exerted by efflorescent crystal growth. The results obtained with the bricks, confirmed by field experience, show that these materials can be applied to the inside of a cellar wall to prevent moisture oozing through, but will not resist water coming out of larger openings under some pressure. Such places must first be filled with mortar or with a plugging cement. *Figure 7* charts typical absorptions of this type of waterproofer. Among the emulsions tested, all four grades have been represented.

Silicones

Silicones have been gaining prominence for a wide variety of applications, including masonry waterproofing. The silicone film produces less change in the appearance than any other waterproofer tried. One manufacturer recommends flooding on the surface; but as a dilute solution is used, the surfaces of the pores are probably lined only a few molecules deep. It is believed that a chemical bond is formed with silica molecules in the masonry, so that it may be necessary to confine the application to silicates, which include brick, mortar, concrete blocks, sand-lime brick, etc.

The hydrocarbon part of the silicone compounds is water repellent so that the pores have negative capillarity and resist the ingress of water. However, water under higher pressure will pass into the larger openings, and anything greater than about 1/16 in. should first be pointed up. *Figure 7* also gives some absorption results. The silicones tested are classed as grade A. Silicones do not seem to interfere with breathing to any appreciable extent, an important property.

Bricks treated on five sides were placed with the untreated sides down in 10 percent sodium sulfate solution, but showed no appearance of salt in a week. When placed on the roof through the last part of the winter of 1949, especially during March, no evidence of harm could be detected. A year later, however, the treated sides of some bricks were spalled off to the depth of about ¼ in., probably due to freezing while saturated, and much of the water repellency had disappeared.

Stucco Waterproofing

A great many million square yards of cement block walls have been coated with stucco applied by hand, and when reasonably good materials and workmanship are employed good results have generally been obtained. Such ready-mixed materials as "California Stucco" have given good service through the years. However, application costs are rather high, so that attention has lately been turned to spraying. Three types of spraying equipment have been studied in this investigation:

1. The materials mixed dry are placed in a hopper and drawn by a Venturi effect to the nozzle where the necessary water is added. Air under high pressure is required.

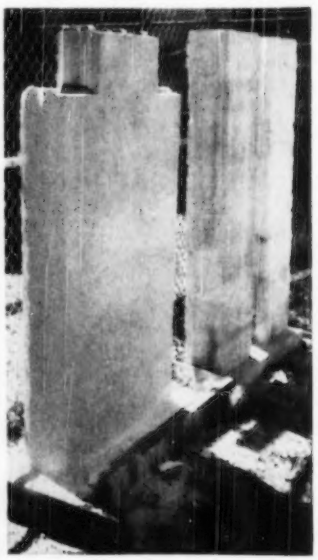


Figure 8.—Sprayed-on stucco panels

2. A fine sand and a cement containing a stearate integral waterproofer and a little lime are mixed with just enough water to form a soft plastic mass which is introduced into a small hopper above a spray gun. The gun operates at about 15 psi. pressure.

3. The solids are suspended in a lot of water, are forced under pressure through a long hose to the spray nozzle where air under considerable pressure atomizes the suspension.

Cinder block piers have been rendered tight by all three methods, at least after preliminary soaking periods. The second method is preferred as being most nearly foolproof, and both laboratory tests and field observation indicate that it is probably most capable of providing the best results. *Figure 8* shows piers coated by the second and third method.

Description of Screen

One limitation of spraying is that a rough surface is produced, much like stippling. Such a texture can be used to very good advantage over rough block masonry. It can be smoothed out with a small amount of effort, when a plane finish is desired. Another limitation lies in the spatter, similar to that produced in paint spraying. However, the speed of covering is sufficient to give spraying of thin coatings some economic advantage. All three methods can be applied to give grade A results.

The sprayed-on stuccos seem to permit adequate breathing. The stucco applied by the second method and containing stearate waterproofer has resisted the tendency of sodium sulfate solution to form an efflorescent deposit in the laboratory but has not yet been tested on the roof. This material and method have been developed in connection with a cement block system which is laid up "dry wall." The sprayed-on stucco serves to fill the joints, apparently far better than in orthodox walls laid up by most masons.

Conclusions

The choice among these materials will be governed by a variety of considerations, such as: cost and availability of material, cost of application, type and age of wall to be treated, its exposure, opportunity for internal ventilation of the wall, etc. Each has its advantages and each its limitations.

In order to summarize factors influencing the applicability of different types of waterproofers to particular cases, the following chart is presented. This chart gives the results of dozens of individual tests on various brands and types of waterproofers. The chart, of course, is useful only as a general guide because such things as "cost" and "ease of application" depend on factors which can only be comparative under one set of conditions. It is believed, nevertheless, that this chart will be of value when used with discretion.

Cost estimates for two-coat applications on masonry of average roughness have been made, based on these ex-

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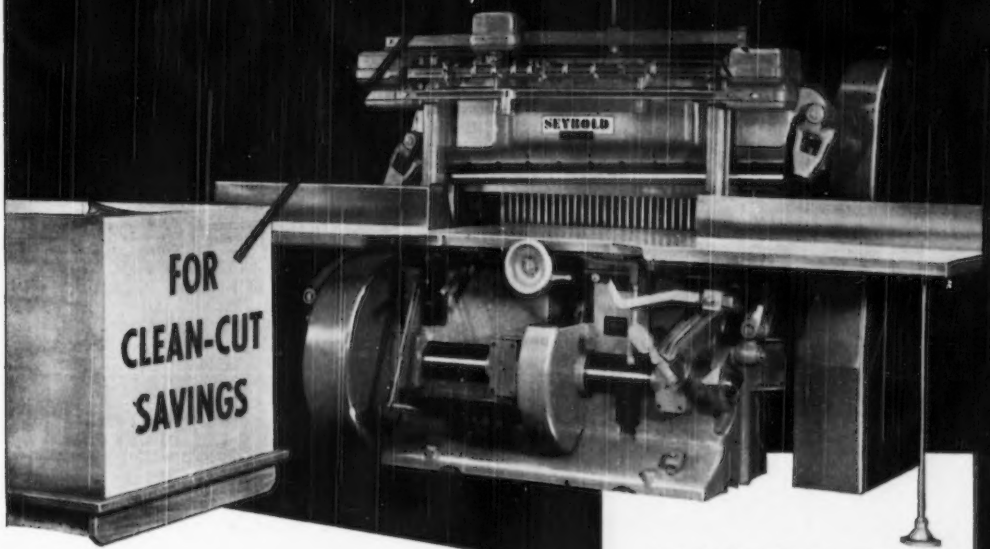

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periments. For cement type waterproofers about eight to ten cents a square foot, which allows for material and conscientious scrubbing in, should be figured. For sprayed-on stucco these two items will run to about ten to twelve cents. For all of the solvent and emulsion systems the costs will be as low as eight cents and as high as twelve cents, depending upon the material cost. Pointing up openings too large to be sealed may run the cost up another three to five cents. This item is avoided where stucco is sprayed on, however.

Acknowledgment

Grateful acknowledgment is made to Hans Sternheim for assisting in obtaining the results reported here.

Materials

The materials covered included cement-type waterproofers, colored solvent systems, pigmented solvent systems, and clear and pigmented emulsions. The materials were supplied by the individual companies as indicated below and grateful acknowledgment is made to the suppliers of these materials:

Cement-Type Waterproofers

Abbey Hart Co., E. Orange, N. J.
Alexite Engineering, Colorado Springs, Colo.
American StaDri Corp., Brentwood, Md.
Celadri Corp.
Haynes Products Co., Omaha, Nebr.
Industrial Plastics Co., Jacksonville, Fla.
International Aquella Products Co., New York, N. Y.
Kaytite Co., W. Orange, N. J.
Medusa Portland Cement Co., Cleveland, Ohio.
Reardon Co., St. Louis, Mo.
Riverton Lime and Stone Co., Riverton, Va.
Sika Chemical Co., Passaic, N. J.
Standard Dri Wall Products, New Eagle, Pa.

Solvent Systems, Colorless

Brooklyn Varnish Co., Brooklyn, N. Y.
Dewatex Manufacturing Co., New York, N. Y.
Dewey & Almy Chemical Co., Cambridge, Mass.
Du Pont Company, Fabrics and Finishes Division, Philadelphia, Pa.
Haynes Products Co., Omaha, Nebr.
Sika Chemical Co., Passaic, N. J.
Stanley Chemical Co., E. Berlin, Conn.
Stringer, H. R., River Road, Bound Brook, N. J.
Xpando Corp., Long Island City, N. Y.

Solvent Systems, Pigmented

American Pipe and Construction Co., Los Angeles, Calif.
B. F. Goodrich Chemical Co., Cleveland, Ohio.
Truscon Laboratories, Detroit, Mich.
Shawinigan Products Co., New York, N. Y.

Emulsions, Clear and Pigmented

Bakelite Corp., New York, N. Y.
Du Pont Co., Electrochemicals Division, Wilmington, Del.

Silicone Resins

General Electric Co., Waterford, N. Y.
Wurdack Chemical Co., St. Louis, Mo.

Sprayed-On Stucco

Bondact Cement Gun Co., c/o R. E. Brooks Co., New York, N. Y.
Norris Self-O-Line Block Co., Philadelphia, Pa.
Pennsylvania Spray-Crete Co., Chester, Pa.

Economic Aspects of Papermaking Fibrous Raw Materials*

Louis T. Stevenson[1]

Northeast Europe, the United States, and Canada are the main areas of the world bearing pulpable species. The lead in pulping processes in the United States has shifted from sulphite to sulphate pulp. In 1960 a total of 30 million tons of paper and board will be needed for United States consumption.

Introduction

The paper industry is an old industry, as industries go. It far antedates such industries as the railroad industry, the motor car industry, and the electrical industry, to say nothing of those vigorous youngsters, the airplane and radio industries.

Ever since its founding in China in the first century A.D. the paper industry has been searching for new, better, and cheaper raw materials. In the first seventeen hundred years it had found nothing more satisfactory to widen its raw material base than linen and cotton rags. About the year 1800 Scheele's experiments resulted in the application of chlorine to the bleaching of colored rags for the production of white paper, thus enlarging the raw material base for that most important product of the industry.

Research had been undertaken before that time by a number of individuals into the possibility of using annual growth fibers for papermaking. Jacob Christian Schaeffer, between the years 1765 and 1772, made paper from eighty different vegetable fibers.

Paper, being made from cellulose fibers, can use for its raw material any leafy green plant. Papermakers have therefore practically an inexhaustible supply of raw material. The main problem is the economic choice of which one to use. To be sure, each of the raw material sources is endowed with different physical and chemical characteristics. Each has its problems of assembling and harvesting. But each is a potential competitor of all others, and is therefore an economic factor that gets balanced, either consciously or unconsciously, by the paper manufacturer in his choice of the fibers from which to make his products.

Principal Fibrous Materials

The principal fibrous raw materials used in papermaking today are:

> Wood pulp of various kinds and grades, waste paper, straw, rags, flax, cotton (staple and linters), manila stock, and various other fibers such as used jute rope.

The foregoing list represents the major raw materials used in the United States. For England and the European continent the list should include esparto grass from Spain and North Africa.

The relative importance of these raw materials to the United States paper industry will be recognized by the fact that in 1948 wood pulp was 61.4 percent and waste paper 32.4 percent, or a total of 93.8 percent of all the fibrous material consumed. The following tabulation gives the detailed percentage breakdown of fibrous materials for the years 1944 and 1948:

[1] Economist, American Paper and Pulp Assn.

[2] Presented at the Fourth Annual National Meeting of Forest Products Research Society at Portland, Oregon, June 26th-29th, 1950.

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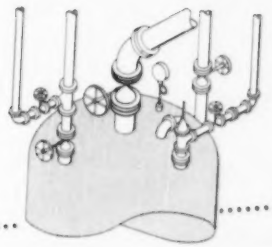

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Material	1944 Per Cent	1948 Per Cent
Rags	2.28	1.78
Paper Stock	36.59	32.40
Manila Rope	.05	Included in Other
Straw	2.97	2.23
Other	2.09	2.19
Total	43.98	38.60
Wood Pulp	56.02	61.40
Grand Total	100.00	100.00

The 1944 data are strongly influenced by the wartime conditions of wood pulp shortages in the United States, while the 1948 data show a more normal competitive structure.

Including wood pulp, which will be discussed at length somewhat later, all these materials are waste or "scavenger" materials. They are by-products discarded after the primary utility has been absorbed in the production of some other good or service. Each one presents a collection problem of no mean importance. The collection of waste paper, for example, is a well organized business, but less than 30 percent of the total paper and board consumed (including imports of newsprint) normally reaches the paper mills again as a raw material in the shape of waste paper. The balance is destroyed either in or after its primary use.

Wood Pulp the Major Papermaking Material

The foregoing tabulation shows that in 1948, if the wood pulp content of waste paper is counted, 91 percent of papermaking fibrous raw materials originated in the woods. More than 61 percent was virgin wood pulp and about 30 percent was reused in the form of waste paper.

World's Wood Distribution

The accompanying map *(Fig. 1)* of the world on Mercator's projection will give a broad picture of the distribution of the world's forest resources. One should recognize, when looking at this map, that Mercator's projection of necessity distorts, by stretching out, the extreme northern and southern hemispheres. In this map it tends to overemphasize the acreage of conifers in the northern hemisphere. Nevertheless the map shows the dominant position of the northern hemisphere with respect to the conifers. These areas are shown in black. The almost treeless areas appear as white areas. It is easy to pick out the white areas of the plains states in the United States and Canada, the Argentine pampas, the Sahara, Gobi, and Australian deserts, the steppes of Russia, and the South African veldt.

Dominance of Coniferous Wood

"The pulping industry has been utilizing soft coniferous woods primarily for several reasons, among which, for example, may be cited:

(a) The longer fibers of the conifers have been considered indispensable for strength properties.

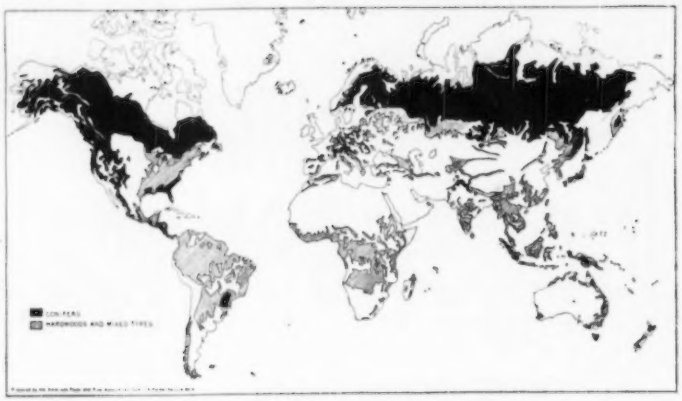

Fig. 1.—Important timber areas of the world.

(b) The generally more porous structure has provided greater facility in the penetration of chemicals for chemical pulping.

(c) The combination of longer fibers and softer structure have made the conifers better adapted to mechanical pulping with superior results."[1]

Due to these features coniferous wood is the dominant pulpwood for use in the following pulping processes: (1) sulphite, (2) groundwood, (3) sulphate, (4) soda.

The semichemical pulping process, which has been developed comparatively recently, is being used successfully in the pulping of both hardwood and softwood. It seems to have a great future ahead for hardwood pulping.

Volume and Availability of Pulpwood

The dominant position of the northern hemisphere with respect to coniferous wood and the adaptability of that wood to the major pulping processes results in the fact that almost the entire world production of wood pulp is in the northern hemisphere. There is some wood pulp production in South America, Australia, New Zealand, and South Africa from native woods. But compared with the northern hemisphere production it is not significant.

Accessibility of wood supply is an important economic factor that has its effect upon northern Canadian, Russian, and Siberian wood supplies. Mainly because the rivers in these regions run north into the Arctic ocean and are frozen for most of the year and because of the human and operational difficulties of operating in these areas, there is little use made of these forests for pulping.

That leaves northeast Europe, the United States, and Canada,—west coast and St. Lawrence basin,—as the main accessible forest areas bearing coniferous wood. These are the papermaking areas of the world, and accessibility of pulpable species is the principal reason.

Regional United States Supplies of Wood

The latest available comprehensive survey of the United States forests gives the status at the beginning of 1945 and the following discussion and tables are based on that Survey.[2] Drain, wood pulp, and plupwood data are for the year 1944 unless otherwise noted.[2]

In the accompanying maps *(Figs. 2 and 3)* timber stand, growth, and drain are shown in millions of cubic feet by

[1] W. E. Byron Baker, Manager Paper Research, New York and Pennsylvania Company.

[2] Pulpwood receipts data, American Paper and Pulp Association Pulpwood Survey and Wood Pulp Production, U. S. Pulp Producers Association; Forest data, Forest Service Report I, from a Reappraisal of the Forest Situation issued in 1946.

Table I

TIMBER STAND, GROWTH, AND DRAIN IN MILLIONS OF CUBIC FEET BY REGIONS

Region	All Timber			Softwood		
	Stand	Growth	Drain	Stand	Growth	Drain
New England	24,626	897	761	11,318	419	375
Middle Atlantic	27,359	1,397	846	5,376	273	180
Lake	23,200	812	747	7,000	178	323
Central	20,992	1,440	1,201	1,479	93	49
Plains	3,723	120	118	269	11	7
South Atlantic	35,965	1,761	1,596	17,031	1,007	1,063
Southeast	54,220	2,714	3,023	23,841	1,480	1,789
West Gulf	40,689	1,916	1,842	17,460	1,033	851
Oregon and Washington	145,879	1,243	2,618	144,122	1,211	2,613
California	44,600	335	489	44,600	335	489
No. Rocky Mt.	33,350	540	316	32,926	537	310
So. Rocky Mt.	15,442	195	104	14,573	177	102
All Regions, Total	470,045	13,370	13,661	319,997	6,756	8,151

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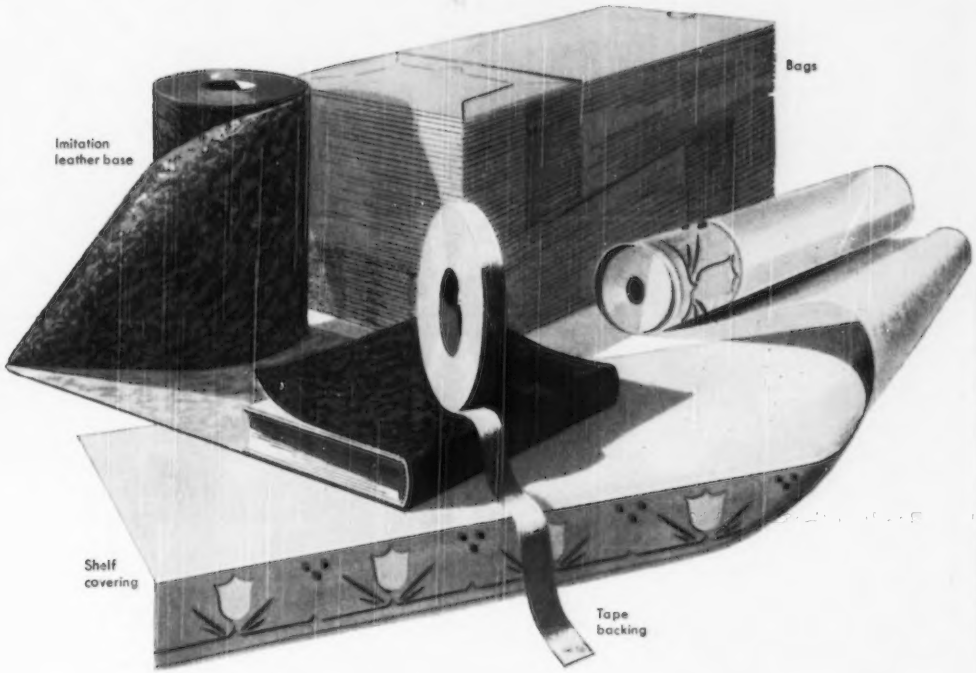

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regions. The shaded areas represent the timber stand, plotted on the same scale for comparison. *Fig. 2* shows these data for the total timber stand; *Fig. 3* for softwood. *Table I* is the basis for these maps.

Wartime Data

It should be recognized at once that this picture represents almost peak wartime conditions. The nation was putting forth its maximum wartime effort with the feeling that all possible sacrifice must be made to support the boys in the armed services.

Broad Facts

Taken as a whole it should be recalled that the forests products compete with one another for raw material. The product of the forest, a tree, may be used by anyone of several competing industries. The major uses are indicated in *Table II* for the year 1944.

Each one of these consumers of wood has its own particular requirements to which the wood supply must be adjusted. That these requirements may be changed from time to time by technological developments is well illustrated in the case of pulpwood for the paper industry where the southern pines 45 years ago were considered unpulpable, and are now our largest source of pulpwood.

The constantly shifting economic forces that play upon these industries are reflected in their demands for wood. These shifting demands in turn play upon the available supply of wood, the components of which have varying growth cycles, differing conditions of harvesting, of size, location, terrain, growth and species in the different regions.

Pulp Mill Requirements

The pulp and paper industry has been built to its present size largely upon the basis of using wood that was discarded as unmanufacturable by saw-mills and other users. The pulp mill was started to consume such by-products of the saw-mill by such outstanding operations as those of the Brown Company in New England and the Weyerhaeuser Timber Company on the West Coast. Consequently pulpwood has been a "scavenger" or by-product operation for many concerns. In some cases wood from tree farm thinnings as small as 2 inches in diameter is now being used by pulp mills.

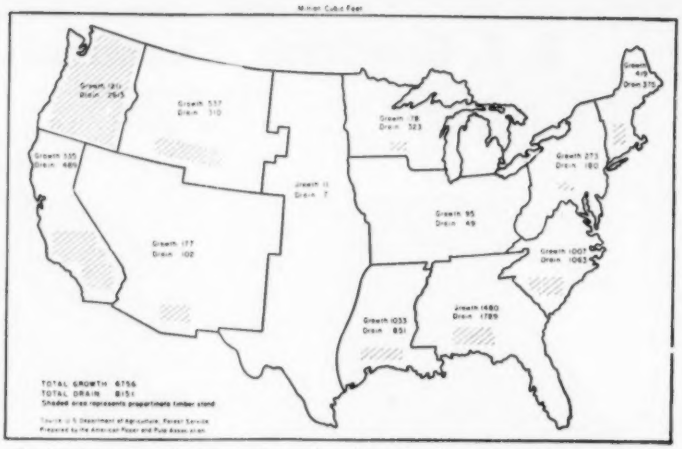

Fig. 3.—Total softwood timber stand, growth, and drain in million cubic feet by regions, 1944.

Table II
DRAIN ON UNITED STATES FORESTS—1944

Use	Millions Cu. Ft.	Per Cent of Total
Lumber	6,711	49.1
Fuelwood	2,203	16.1
Pulpwood	1,306	9.6
Hewed Ties	363	2.7
Fence Posts	220	1.6
Veneer Logs	392	2.9
Mine Timbers	225	1.6
Cooperage	174	1.3
Shingles	72	.5
Other	516	3.8
Total for Manufactured	12,182	89.2
Losses by fire	460	3.4
Losses by insects, etc.	1,019	7.4
Total Drain	13,661	100.0

Pulpwood Prices

In addition to cutting pulpwood from company-owned land, a great deal of pulpwood is bought by pulp mills from small landowners. No accurate measure of the percentage this bears to the whole is available, but current estimates run from 70 percent to 75 percent for the areas east of the Rocky Mountains. The prices paid for this small landowners' wood must compete with those paid by users other than pulp mills, and so indicate the competitive position of pulpwood in the market for forest products. *Table III* shows the average value per cord over a period of years for purchased pulpwood.

It will be seen that spruce and true fir pulpwood has brought consistently higher prices and that southern pine has brought consistently low prices. The average value has fluctuated widely over a period of 48 years.

Regional Production of Wood Pulp

The regional production of wood pulp shows the extent to which the wood pulp industry has grown in the regions where pulpwood has been comparatively cheap and plentiful.

A 1944 comparison of wood pulp production by regions with total timber supply for the same regions is shown in *Table IV*.

It will be observed that there was no production of wood pulp in three regions,—plains, and north and south Rocky Mountains. The plains states have very little wood and the other two are remote from markets, with high freight rates and no water-rail competition. A contributing factor is that National Parks and Forests cover a large portion of the area, while log-

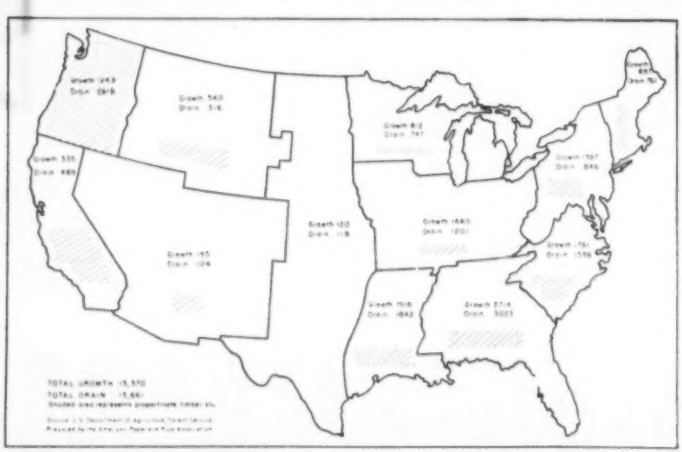

Fig. 2.—Total timber stand, growth, and drain in million cubic feet by regions, 1944.

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Table III

PULPWOOD AVERAGE VALUES[1] PER CORD—1947

(f. o. b. Plant)

By Kind:	Value
Total Pulpwood	$17.83
Spruce and True Fir	25.77
Hemlock	18.47
Jack Pine	19.49
Southern Pine	14.44
Poplar (Aspen and Popple)	18.75
Northern Mixed Hardwoods	20.49
Southern Mixed Hardwoods	14.68
Other, including Slabs and Mill Waste	12.02

By Kind and Condition:	Total	Rough	Rossed and Peeled
Total Pulpwood	$17.83	$17.12	$22.74
Softwood—Total	18.00	17.33	25.03
Spruce and True Fir	25.77	24.58	29.99
Douglas Fir	15.21	15.21	n. g.
Hemlock	18.47	18.28	21.56
Jack Pine	19.49	19.39	20.75
Southern Pine	14.44	14.42	15.10
Other, including Slabs and Mill Wastes	12.49	12.41	13.44
Hardwood—Total	16.75	15.00	19.43
Northern Mixed Hardwoods	20.49	19.68	21.93
Poplar (Aspen and Popple)	18.75	15.86	20.66
Southern Mixed Hardwoods	14.68	14.49	15.34
Other, including Slabs and Mill Wastes	13.81	5.00	14.29

By Divisions and States:	Value	Value
Total United States		$17.83
New England		25.23
Maine	$22.70	
New Hampshire	24.82	
Vermont, Massachusetts and Rhode Island	27.93	
Middle Atlantic		26.38
New York	28.06	
New Jersey	13.37	
Pennsylvania	25.18	
East North Central		22.86
Ohio and Illinois	16.35	
Michigan	23.35	
Wisconsin	23.26	
West North Central		18.30
Minnesota	18.30	
South Atlantic		14.85
Virginia	12.28	
North Carolina	14.35	
Florida	16.23	
Maryland, South Carolina and Georgia	13.41	
East South Central		13.07
Tennessee and Alabama	12.75	
Mississippi	13.47	
West South Central		14.12
Arkansas and Texas	14.02	
Louisiana	14.17	
Pacific		17.05
California	16.16	
Oregon	19.59	
Washington	16.50	

By Regions:	Value
Total United States	$17.83
Northeast	24.55
Appalachian	16.02
Lake States	21.94
South	14.40
Pacific Coast	17.05

By Years	Total Pulpwood
1947	$17.83
1939	7.82
1938	8.10
1937	7.97
1936	7.71
1935	7.64
1934	7.73
1933	7.37
1931	10.94
1929	13.09
1919	15.95
1909	8.62
1899	4.95

[1] Source: U. S. Bureau of the Census—Census of Manufacturers, 1947.

ging conditions in these areas have not been too easy.

Grow Trends in Wood Pulp Grades

The kinds of wood pulp that are made depend upon the species of wood that are available and the state of technical developments in the industry. The progress in pulping southern wood has been rapid in the last fifteen years. Between 1934 and 1948 the production of all major grades of wood pulp grew considerably. Production of sulphite doubled, groundwood grew by 2½ times, while soda pulp production increased by less than 50 percent. The major growth, however, was in sulphate and the semi-chemical grades. Sulphate production grew to about 5 times and semichemical over 6 times the 1934 production.

The following tabulation will give an idea of the relative importance of the major pulp processes:

Process	Percentage of Total Production 1934	1948
Sulphite	33%	22%
Sulphate	28	47
Groundwood	29	23
Soda	8	4
Semichemical and other	2	4
Total	100	100

The lead has shifted from sulphite to sulphate pulp, due largely to the development of the southern pine regions through technological developments in the sulphate pulping process.

State Ranking

Shifts in the state rankings with respect to the production of wood pulp do not occur rapidly. In the three years from 1944 to 1947 the state of Washington retained first place, and Maine and Louisiana followed, in that order.

Future Requirements

Projections of paper and board production into the future indicate that by 1960 a total of 30 million tons of paper and board will be needed for United States consumption. Of these 30 million tons five million tons of newsprint will probably be imported, which leaves 25,000,000 tons for domestic paper and board production. On the basis of 1948 data this will require 26,800,000 tons of raw materials, of which 16,400,000 tons will be wood pulp. This, on the same 1948 basis, would be divided among the grades as follows:

Process	Tons
Sulphite	3,608,000
Sulphate	7,708,000
Groundwood	3,772,000
Soda	656,000
Semichemical	656,000
Total	16,400,000
Allowing for	
Wood Pulp Imports	2,000,000
Leaves (domestic production)	14,400,000

To produce this volume of wood pulp

Table IV

COMPARISON OF WOOD PULP PRODUCTION BY REGIONS WITH TOTAL TIMBER SUPPLY

Region	Total Timber Supply Million Cubic Feet	Wood Pulp Production Tons
New England	24,626	1,277,826
Middle Atlantic	27,359	811,379
Lake	23,200	1,403,241
Central	20,992	72,396
Plains	3,723	.....
South Atlantic	35,965	1,374,424
Southeast	34,220	1,954,207
West Gulf	40,689	1,346,254
Oregon and Washington	145,879	1,668,716
California	44,600	Included above
No. Rocky Mountain	33,350	.....
So. Rocky Mountain	15,442	.....
Total	470,045	10,198,443

will require approximately 23,000,000 cords of pulpwood of which about 21,500,000 cords will probably be the portion of domestic wood required. These estimates are based upon the assumption of a distribution of wood among domestic species and imports similar to that of 1949. That this is well within the volume of domestic pulpwood that can be produced without strain would appear from the fact that in 1948 our pulpwood receipts at United States mills were over 22 million cords. A five percent increase in 12 years seems easy of accomplishment.

Conservation Movement

The movement to conserve the forest resources of our country fits in ideally with the interests of the pulp and paper maker, provided timber is grown and harvested on a sustained yield basis. The pulp and paper makers have a tremendously high capital investment and "destructive cutting" operations are also destructive of their sources of raw material. Destructive cutting pushes back the circle of pulpwood procurement until transportation charges eventually become so burdensome that the mills' costs become prohibitive.

With an average investment in 1948 of $23,000 per worker and $214 per ton of annual production, or $66,340 per ton of daily production, the pulp and paper industry is vitally interested in maintaining its investment through assuring a continuous supply of wood at a reasonable cost to the mills. That is the reason why the pulp and paper industry is in the forefront of the commercial practice of good forestry on its own land and is teaching a sound forestry practice to the small landowners that supply pulpwood to it.

Integrated Forestry Operations

It has been found practical in some regions for pulp mills that own forest land to plant seedlings, grow a forest, and in the process to use thinnings for pulpwood and eventually harvest the large trees for sawtimber. These practices are mutually beneficial to both the lumber and pulping industries. It has been asserted that the pulp mill

m the South has made possible the continuous operation of sawmills by providing a market for the thinnings from forest land and thereby has helped the timber grower to carry his sawlogs to maturity.

Summary and Conclusions

Paper can be made from any leafy green plant, for the basic fiber is cellulose, which is found in all such vegetation.

The particular fiber used in a given instance is the result of the play of complex economic forces and involves the interplay of the supply of various fibers, the technical processes available for extracting the fibers, and the end-use requirements for the paper to be made.

Coniferous wood has been found to yield the best and most economical cellulose fibers for the mass production of paper. Raw cotton, cotton and linen rags, straw, flax, and jute have been found to have useful fibers for special papers, but 91 percent of the fiber used in papermaking comes from wood.

The northern hemisphere is in a dominant position with respect to the world supply of coniferous wood, the main accessible forest areas being those of northeastern Europe, Canada, and the United States.

Growth and drain of all timber in the United States is respectively about 3 percent of supply. About 10 percent of the drain is in pulpwood, 10 percent lost through fire and disease, and the remaining 80 percent in other wood-using competing industries.

Frequently a pulp mill was started to consume wood considered unmanufacturable by sawmills and other wood-using industries.

The wood pulp industry has developed in regions where pulpwood has been comparatively cheap and plentiful. The kinds of wood pulp made depend largely on the available species of wood. The production of sulphate pulp has increased 5 times since 1934 and has, due to the development of the southern pine region, become the major grade of wood pulp, accounting for 47 percent of the total.

A projection of future requirements indicates that the United States can easily meet its expected 1960 pulpwood requirements without increasing its imports of pulpwood. The movement on the part of the industry to conserve the forest resources of this country is tied-in with the high capital investment of pulp and paper mills, among which there is a growing tendency toward integrated forestry operations.

SUPPLIERS

United States Rubber Co., mechanical goods div., has announced the transfer of sales and technical service activities for printing materials from New York to Providence, R. I. The move is aimed at closer coordination between sales and production. Headquarters in Providence will be at the company's plant at 355 Valley street.

New Hooker-Detrex Trichlorethylene Plant

Completion of a large, modern trichlorethylene manufacturing plant at Ashtabula, Ohio has just been announced by Hooker-Detrex Incorporated . . . The full production capacity of the new plant will be utilized in the manufacture of Perm-A-Clor and Triad metal degreasing solvents for the Detrex Corp., Detroit 32, Mich. . . . Hooker-Detrex Inc. is a jointly owned subsidiary of Hooker Electrochemical Co. and Detrex Corp. The works manager of the Ashtabula plant is H. D. McKinley, formerly manager of the Solvents Division of Detrex.

DARWIN MISCALL

KEN HAY

Asten-Hill Mfg. Co. announces that Darwin Miscall, after operating his own business for a while, has joined the company in Philadelphia. He is taking over the sales territory, comprising Delaware, Maryland, New Jersey, Ohio, Pennsylvania, Virginia and West Virginia, formerly covered by Ken Hay.

Mr. Hay's new headquarters are in Appleton, Wis. His sales territory now includes Illinois, Indiana, Michigan, Minnesota and Wisconsin, formerly covered by L. F. Knickerbocker.

Chiksan Co., of Brea, Calif., has appointed Clifford B. Ives & Co., 105 Forrest avenue, Narberth, Pa., as representatives in the Philadelphia territory. The Rhodes Controls Co., 11 East 21st street, Baltimore, Md., has been appointed to represent Chiksan in the Baltimore area. Both of these territories were covered previously by Chiksan's eastern headquarters in Newark, N. J.

B. F. Goodrich Chemical Co. reports expansion of general chemicals plant at Avon Lake, Ohio, will commence immediately. The new manufacturing facilities will produce Geon polyvinyl chloride resins.

The new plant, to be completed in mid-1951, will cover seven acres on the company's 225 acre tract at Avon Lake, 22 miles west of Cleveland, where there is located at present a general chemicals plant, experimental station, and currently under construction, an applied research laboratory. The vinyl resin plant will consist of two buildings: a three-story process building with 40,000 square feet of floor space and warehouse.

Engineering and process construction will be handled by The Girdler Co., Louisville, Ky., and plant buildings, underground sewers, roads and other facilities will be built by The Sam W. Emerson Co., Cleveland.

General Electric has made three key appointments in the San Jose, Calif., Motor Division of the company's Small and Medium Motor Divisions. These are: Charles Stoeckly as manager of the sales division, Carl J. Andersen as manager of the manufacturing division, and L. A. March as manager of the engineering division.

Formerly motor specialist for the company's Pacific Sales District with headquarters at San Francisco since 1944, Mr. Stoeckly replaces L. Dean Fowler who recently became manager of sales for the company's Control Divisions at Schenectady, N. Y.

FINANCIAL RECORD

PREFERRED STOCKS	Per Share Earnings: Calendar Year 1949	Per Share Earnings: 12 Mo. to Approx. 6/30/50	Indic. Annual Divid. Rate	Sept. 13 Approx. Market Price
Armstrong Cork Co. $3.75 Cum.	$40.95*	$48.14	$3.75	102⅛
Armstrong Cork Co. $4.00 Cum. Conv.	40.95*	48.14	4.00	112
Celotex Corp. 5% Cum.	6.80c	8.75	1.00	16¼
Champion Paper & Fibre $4.50 Cum.	60.09f	89.39	4.50	105⅛
Container Corp. of Amer. 4% Cum.	89.52	104.60	4.00	103⅛
Crown Zellerbach $4.20 Cum.	54.38e	61.85	4.20	105
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.93	12.24	2.50	54½
Flintkote Co. $4 Cum.	62.70	71.81	4.00	106¾
Robert Gair Co., Inc. 6% Cum.	13.79†	15.86†	1.20	18⅛
International Paper Co. $4 Cum.	224.55	264.19	4.00	108½
Kimberly Clark Corp. 4½% Cum.	85.27	117.03i	4.50	106
MacAndrews & Forbes 6% Cum.	61.59	62.97	6.00	141½
Mead Corp. 4¾% Cum.	51.37	82.87a	4.25	93½
Mead Corp. 4% Cum. Conv. 2nd	21.35*	27.76a	2.00	49½
Paraffine Cos. Inc. 4% Cum. Conv.	56.46	59.81	4.00	99⅜
Rayonier Inc. $2 Cum.	9.54	12.09	2.00	34⅛
St. Regis Paper Co. 4.40% 1st A	30.74	36.61	4.40	95⅜
Scott Paper Co. $3.40 Cum.	51.15*	62.16*	3.40	101⅛
Scott Paper Co. $4.00 Cum.	51.15*	62.16*	4.00	109¼
Sutherland Paper 4¼% Conv.	46.92	59.24	4.25	114
U. S. Gypsum Co. 7% Cum.	283.37	340.24	7.00	184
United Wallpaper Inc. 4% Cum. Conv.	2.14	(d)8.00e	2.00	23½
West Virginia Pulp & Paper 4½% Cum.	61.28c	61.06i	4.50	109⅛
COMMON STOCKS				
APW Products Co.	(d)0.81	(d)0.01	—	4¾
American Writing Paper Corp.	.04	0.50	—	7¼
Armstrong Cork Co.	6.57	7.84	$3.00	45⅞
Celotex Corp.	1.65c	2.20	1.00	15⅛
Certain-Teed Prods. Corp.	2.84	3.24	1.00	14½
Champion Paper & Fibre	5.15f	8.16	2.00	40½
Congoleum Nairn Co.	3.04	2.70	2.00	22⅜
Container Corp. of America	8.46	9.62	4.00	53⅜
Crown-Zellerbach	6.02e	6.84	2.00	39½
Dixie Cup Co.	7.44	8.58	1.50	42½
Eastern Corp.	0.04	1.64	(h)	15¼
Flintkote Co.	4.33	4.95	2.50	25½
Robert Gair Co., Inc.	2.11†	2.30†	0.70	9
Great Northern Paper Co.	4.87	3.75	2.80	43½
International Paper Co.	7.12	8.14	2.50	54¾
Johns-Manville Corp.	4.83	6.16	2.50	42⅜
Kimberly Clark Corp.	5.29	6.66i	1.80	40⅛
MacAndrews & Forbes Co.	3.64	3.77	3.00	37⅜
Marathon Corp.	3.29c	4.13i	1.40	31¾
Mead Corp.	4.10	5.57a	1.60	24¾
National Container Corp.	0.95	1.34	0.60	9½
Paraffine Cos. Inc.	0.85	0.90	0.60	13½
Rayonier, Inc.	4.75	6.36e	2.00	37⅜
Ruberoid Co.	8.72	9.06	3.25	49½
St. Regis Paper Co.	0.91	1.11	0.60	10
Scott Paper Co.	6.07	7.38	3.60	45
Sutherland Paper Co.	4.62	5.64	2.75	42
Union Bag & Paper Corp.	5.01	5.16	2.50	33⅞
United Board & Carton	(d)1.61b	0.58i	—	12
U. S. Gypsum Co.	13.51	16.29	9.00	108¼
United Wallpaper	(d)0.01	(d)0.32e	—	2⅞
West Virginia Pulp & Paper	8.58c	8.36i	3.00	63¼

(a) 12 months to approximately 6/15/50
(b) Year ended 11/13/49
(c) Year ended 1/31/50
(d) Deficit
(e) 12 months to 3/30/50
(f) 9 months to 12/31/49
(g) 12 months to approximately 4/30/50
(h) Declared 25c payable Sept. 1, 1950.
(i) 12 months to 7/31/50
(j) 12 months to 5/31/50.
(*) Earnings per combined preferred shares.
(†) Includes domestic and Canadian subsidiaries and 60% equity in Southern Paperboard Corp.

Crown Zellerbach Corp. and its subsidiaries report net income for the quarter ended on July 31, subject to annual audit and year-end adjustment, rose 51 percent over the 1949 July quarter. Net sales were 27 percent over the same quarter a year earlier.

Earnings for the first quarter amounted to $6,081,714, equal to $2 a share on 2,852,882 common shares, against $4,039,600, equal to $1.28 a share, for the first quarter of the previous fiscal year.

Net sales for the 1950 quarter amounted to $48,380,346, compared with $38,185,440 for the same quarter a year before.

Production of paper and pulp for sale established a new quarterly record of 221,187 tons, compared with 188,332 tons produced a year before.

In July, 1950, prepayment of $3,000,000 was made on notes maturing on July 31, 1951, and January 31, 1952, leaving a balance outstanding at the close of the quarter of $20,000,000. Negotiations have been concluded with the banks holding the present loan, which became effective on August 31, 1950, to reduce substantially the serial payments and extend the final maturity from January 31, 1957, to August 31, 1960, without any change in the amount of the loan. The interest rate on the revised loan will be 2⅜ percent.

Union Bag & Paper Corp. declared a regular quarterly dividend of 50 cents per share and an extra dividend of 50 cents on the capital stock, both payable September 15, 1950, to stockholders of record September 8, 1950.

Fraser Companies Ltd. has declared a dividend of 50c per share on common and another dividend of $1.18 on preferred, payable October 23 to stockholders of record September 30.

Nekoosa-Edwards Paper Co. have declared a quarterly dividend of 25 cents per share and a special dividend of 25 cents per share, payable September 30, 1950, to stockholders of record at the close of business on September 14, 1950. There are 346,500 shares of common stock outstanding.

Bathurst Power and Paper Co. Ltd. net profit for the six months ended June 30 is estimated at $1,034,321 equal to $2.59 per Class "A" share. This compares with $873,703 or $2.18 per share reported for the similar period of last year. Depreciation and depletion charges are carried at $361,412 against $320,810 and estimated income taxes at $704,876 against $619,112.

Working capital at June 30 was shown at $7,548,590 against $8,150,300 at June 30, 1949. Current assets of $10,643,408 include cash and marketable securities of $4,709,144 compared with $3,691,312 included in the $10,076,536 of current assets shown at June 30, 1949.

Great Lakes Paper Co. showed net profit for the six months ending June 30, 1950 was $1,004,546. This is 35.4 percent higher than the corresponding 1949 net of $741,917. The six months net is equivalent to earnings of $5.23 on the combined class "A" and class "B" shares and of $2.07 a common share as compared with $3.80 and $1.41 respectively for the first six months of 1949. In the whole year 1949, the net was equivalent to $9.12 on the combined class "A" and "B" shares and to $3.49 a common share.

The company has declared a dividend of 40c a common share and 62½c on "A" stock payable September 30 to stockholders of record September 9.

Improve Southland's #2 Machine

NEW YORK — Another Ross-Orewin System has been added to the list of those installed at the Southland Paper Mills, Lufkin, Texas. This latest system is for their No. 2 machine.

Amazing New Pipe *and* Fittings USCOLITE

SO TOUGH YOU CAN DRIVE A NAIL WITH IT

NO METALLIC CONTAMINATION

FURNISHED IN STANDARD LENGTHS YOU CAN CUT TO SIZE AND THREAD ON THE JOB

HANDLES CORROSIVE CHEMICALS, ACIDS, ALKALIS, SALTS

A remarkably strong and versatile plastic piping, resistant to most commonly used industrial chemicals has been produced by the scientists of United States Rubber Company. Known as "USCOLITE" this new material has an extremely high impact strength. Furnished in standard lengths, it can be cut to length and threaded on the job. Uscolite Pipe Fittings are also available. The "U. S." engineering staff will provide more detailed information upon request. Write to address below.

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U.S.RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

PRICES

The prices below reflect general market quotations at the mill level on the standard grades in which the normal volume of business is being done. Does not include occasional spot offerings.

NEW YORK
Delivered Ports

Standard News, per ton—
Rolls, contract ..... $100.00/ —
Sheets ..... 115.00/ —
F.o.b. Mills. Carload freight allowed, dock N. Y.

Kraft— per cwt., 40# base wgt.
Standard Wrapping Rolls ..... ‡ $6.75/$7.25
No. 1 Wrapping Rolls 7.50/ 8.00
Standard Bag ..... ‡ 6.50/ 7.00

Tissues—per ream 24x36 (480) 10 lbs.
2500 lbs. or more
Wh. No. 1 Frd ..... ‡ $1.60 /$1.65
Wh. No. 1 MG ..... ‡ 1.60 / —
Wh. No. 1½ ..... ‡ 1.55 / —
Wh. No. 2 ..... ‡ 1.45 / —
Kraft Non-Tar .....
White Non-Tar .....
‡ Pricelists withdrawn by mills.

Toilet— per case of 100 rolls—1 M sheets
Unbleached 4½x4½ ..... $5.90/ —
Unbleached 4½x5 ..... 5.85/ —
Bleached 4½x4½ ..... 7.10/ —
Bleached 4½x5 ..... 8.80/ —
Per Case of 50 rolls—2000 sheets
Unbleached 4½x4½ ..... $5.90/ —
Bleached 4½x4½ ..... 6.95/ —
Per Case of 100 rolls—1000 sheets
Facial, 4½ x 5, 2 ply ..... $8.95/$9.45

Paper Towels—per case of 3750.
Wh. Jr. M'tif'd 9¼x9½ $5.25
Br. Sr. M'tif'd 10x12 ..... 3.60
Br. Jr. M'tif'd 9¼x9¾ 3.10
Br. Jr. Sgl. fold 10x10¾ 3.15
Blchd. 7½ x 11, 24/25 rolls ..... $3.95/$6.25

Manila, per cwt.
No. 1 Jute Tag sheets* ..... $15.55/$17.55
Reg. Jute M.F. 40 lb., sheets* .. 14.00/ 16.00
Wrapping Manila 8.75/ 10.50
Printing Manila 10.00/ 11.00
* Less usual allowance for rolls.

WORLD WOOD PULP MARKETS
Third Quarter Contract Price, Per Short Air-Dry Ton

	Delivered, with varying freight allowance		On dock Atlantic Ports		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$65.00/ 70.00	$70.00/ —			
Sideruns Pulping News .	$65.00/ 66.50	65.00/ 66.00			
Soda, Bleached	120.00/122.00	122.00/ —			
Sulphate, Bleached	122.00/143.00	131.00/ —	*130.00/137.00†		*129.00/ —
Sulphate, Unbl'd North'n		95.00/105.00	*90.00/ 97.50†		
Sulphate, Unbl'd South'n	90.00/ 95.00			* In	
Sulphite Blchd. (S'ftw'd)	122.00/125.00	125.00/ —	*125.00/128.00†	Competitive	Competitive
Sulphite, Blchd. (H'dw'd)	120.00/ —			range	
Sulfite, Semi-blchd.	112.00/ —				
Sulphite, Unbleached ...		107.00/ —	107.00/110.00†		
Sulphite, Unbl'd (Glassine)		110.00/ —	111.00/ — †		

* On dock. † Delivered.

Fourth Quarter Indications, Per Short Air-Dry Ton

Groundwood	$75.00/ —			
Sulphate, Bleached	140.00/ —	$141.00/ —	*$165.00/ —	
Sulphate, Unbl. Northn. .		110.00/120.00	*138.00/ —	
Sulphate, Unbl. Southn. .				
Sulphite, Blchd. (S'ftw'd.)	130.00/ —	135.00/ —	*160.00/ —	
Sulphite, Unblchd		117.00/ —	*138.00/ —	
Sulphite, Unbl'd (Glassine)			*142.00/ —	
Soda, Blchd.	130.00/ —			

Gummed Tape—per bdl., 500 bdls. or more.
90 lb. 375 ft. GSI ..... ‡ $6.60/ —
60 lb. 600 ft. GSI ..... ‡ 6.00/ —
35 lb. 800 ft. GSI ..... ‡ 7.50/ —
35 lb. 500 ft. GSO ..... ‡ 5.70/ —

Boards, per ton—
Filled News ..... $87.50/$92.50
Plain Chip 85.00/ 90.00
Blchd. Mla. Ld. Chip 112.00/115.00
White Pat. coated .020 ..... 130.00/135.00
Kraft Liners 42 lb. ..... 105.00/ —
Kraft Corr. .009 ..... 110.00/ —
Binders Boards 120.00/124.00

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$57.55/$59.45
100% Rag	50.65/ —
75% Rag	39.20/ 39.30
50% Rag	32.35/ —
25% Rag	27.70/ —

Ledgers	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$60.15/ —
100% Rag	51.90/ —
75% Rag	40.45/ 40.55
50% Rag	32.35/ 33.65
25% Rag	29.00/ —

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
Watermarked	$18.15/$19.00
Plain	17.10/ 17.45

Ledgers	4 Ctns.
	per cwt.
Watermarked	$20.15/$20.30
Plain	18.55/ 18.75

White Book

Conversion Coated	Case
	per cwt.
No. 1	$21.65/$21.75
No. 2	20.15/ 20.40
No. 3	19.65/ —
Machine Coated	
No. 1	$16.90/ 17.15
No. 2	14.90/ 15.15
Uncoated	
No. 1 Antique (Watermarked)	$17.15/ 18.65
Offset	16.15/ 16.90
A Grade E. F.	16.15/ —
A Grade S. C.	16.65/ 16.90
B Grade E. F.	15.40/ —
B Grade S. C.	16.15/ —

‡ Indicates a price change.

WASTE PAPER MARKET

The following quotations were gathered from major dealers in each market. They are an indication of the price range in which volume tonnage was moving on the date specified. Spot offerings or special packings are not necessarily included. Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) ALL PRICES NOMINAL.

	New York	Philadelphia	Boston	Chicago
	Sept. 8	Sept. 8	Sept. 9	Sept. 7
No. 1 Mixed Paper	$18.00/ 22.00	$18.00/ 20.00	$16.00/ 17.00	$19.00/ —
Boxboard Cuts	14.00/ 20.00	18.00/ 20.00	14.00/ 16.00	23.00/ —
Mill Wrappers	20.00/ 29.00	25.00/ 30.00	17.00/ —	21.00/ —
No. 1 News	23.00/ 24.00	21.00/ 23.00	21.00/ 22.00	25.00/ —
Overissue News	27.00/ 32.00	24.00/ 28.00	17.00/ 20.00	28.00/ —
Corrugated Containers	33.00/ 35.00	32.00/ 36.00	32.50/ 35.00	35.00/ —
New Corrugated Cuts	38.00/ 40.00	35.00/ 40.00	35.00/ 40.00	40.00/ —
Double Kraft Ld. Corr. Cuts ..	65.00/ 70.00	55.00/ 58.00	45.00/ 60.00	70.00/ —
Used Kraft Bags	42.50/ —	55.00/ 58.00	40.00/ —	45.00/ —
No. 1 Brown Kraft Paper	42.50/ —	45.00/ 50.00	45.00/ —	45.00/ —
Super Assorted Bl. Kraft	55.00/ —	55.00/ 60.00	50.00/ 80.00	55.00/ —
New Bl. Kraft Env. Cuts	95.00/100.00	80.00/ 90.00	85.00/100.00	85.00/ —
New Bl. Kraft Cuts	58.00/ 65.00	75.00/ 80.00	60.00/ 75.00	80.00/ —
No. 1 Gdwd Shvs.	40.00/ 45.00	35.00/ 45.00	40.00/ —	40.00/ —
White Newsblanks	70.00/ 75.00	65.00/ 75.00	55.00/ 65.00	60.00/ —
No. 1 Flyleaf Shvs.	50.00/ 55.00	45.00/ 50.00	50.00/ —	55.00/ —
No. 1 Soft Wht. Shvs.	100.00/115.00	110.00/125.00	90.00/105.00	105.00/ —
Super Soft Wht. Shvs.	125.00/127.00	120.00/130.00	100.00/115.00	115.00/ —
Hd. Wht. Shvs.	120.00/130.00	130.00/150.00	120.00/135.00	130.00/ —
Hd. Wht. Env. Cuts	140.00/150.00	140.00/170.00	140.00/150.00	140.00/ —
New Manila Env. Cuts	80.00/ 90.00	80.00/ 90.00	80.00/ 90.00	80.00/ —
Col. Tab Cards	55.00/ —	55.00/ 70.00	50.00/ 55.00	— / —
Manila Tab Cards	95.00/115.00	95.00/120.00	90.00/100.00	100.00/ —
No. 1 Mixed Ledger	55.00/ 60.00	55.00/ 65.00	45.00/ 55.00	— / —
White Ledger	75.00/ 80.00	75.00/ 80.00	65.00/ 75.00	75.00/ —
Mixed Books & Mags.†	27.50/ 30.00	20.00/ 35.00	25.00/ 30.00	— / —
No. 1 Reg'd. Hvy. Books‡	35.00/ —	40.00/ 45.00	40.00/ —	— / —

* Delivered. † Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood.

Rag Market
New Domestic Cotton Cuttings
(Prices to Dealers, F.o.b. Ship. Pt.)
ALL PRICES NOMINAL

White Shirt	$14.00/$14.50
Unbleached Muslin	14.00/ 14.50
Light Silesias	8.00/ 9.00
White Black Blue Overalls	9.00/ 10.00
Blue Overalls	5.00/ 5.25
Fancy Shirt	5.00/ 5.50
Percales	6.50/ 7.50
Light Prints	6.00/ 6.75

No. 1 Washables	3.50/	3.75
Bleachable Khaki	8.00/	—
Unbleachable Khaki	5.00/	—
Cottonades	4.25/	4.75
Lt. Flannelettes	8.50/	—
Men's Corduroy	3.75/	4.25
Women's Corduroy	4.00/	4.25
Canton Flannels, Blchd.	12.00/	—
Underwear Cutters, Blchd.	13.50/	14.00
Underwear Cutters, Unblchd.	13.00/	13.50

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)
ALL PRICES NOMINAL

	Per 100 lbs.	
Mixed White	$3.25/	$4.50
Cotton Pants & Overalls	3.25/	4.00
Thirds and Blues, Repacked	3.00/	3.25
No. 1 Roofing Rags	1.65/	1.75
No. 2 Roofing Rags	1.45/	1.55
No. 3 & 4 Roofing Rags	1.35/	1.45
Roofing Bagging	1.35/	1.45

New Foreign Cotton Cuttings
(Prices to Mills, F.o.b. Dock, N. Y.)

	Per 100 lbs.	
New Dark Cuttings	$3.25/	$3.50
New Mixed Cuttings	3.50/	3.75
Light Silesias	7.00/	7.50
Light Flannelettes	7.00/	7.50
New White Cuttings	nominal	
New Unbleached Cuttings	nominal	
Fancy Shirt Cuttings	5.50/	6.00
Light Prints	6.00/	6.50
Bleachable Khaki, No. 1	4.75/	5.00
Unbl. Khaki, No. 1	4.00/	4.25

Old Foreign Rags
(Prices to Mills, F.o.b. Dock, N. Y.)

	Per 100 lbs.	
No. 1 White Cottons	$6.50/	$7.00
No. 2 White Cottons	5.50/	6.00
No. 3 White Cottons	3.50/	4.00
No. 4 White Cottons	3.00/	3.50
Extra Light Prints	4.50/	5.00
Old Light Prints	4.00/	4.25
Med. Light Prints	2.75/	3.00
Dutch Blue Cottons	3.25/	3.50
Checks and Blue	2.75/	3.00
Linsey Garments	2.10/	2.40
Dark Cottons, European	2.00/	2.25
Dark Cottons, Egyptian	1.85/	1.95
Old Shoppettes	1.75/	1.85
New Shoppettes	2.00/	2.25

Bagging
(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.	
Foreign Gunny	$5.75/	$6.00
Domestic Gunny, No. 1	5.50/	6.00
Heavy Wool Tares	5.25/	5.75
Foreign Manila Rope	5.25/	5.50
Domestic Manila Rope	5.25/	5.50
Jute Strings	5.50/	5.75
No. 1 Sisal Strings	3.00/	4.00
Mixed Strings	Nominal	
Paper Mill Tares	3.00/	3.50
No. 1 Scrap Burlap		
Foreign	4.00/	4.25
Domestic	4.50/	4.75
Austr. Wool Pouches	5.50/	6.00
New Burlap Cuttings	5.50/	6.00

MATERIALS

Aluminum, sulfate:
comL bags, wks. ..... cwt. 1.50
iron-free 2.75

Alcohol, ethyl:
tax free, dms. c.l. ..... gal. .57 / .87
dedl. East Miss.

Casein, acid-free:
dom. sh. pt. c.l. ..... lb. .35 / .41½
imp. ex dock ..... lb. .34½/ .35

Caustic soda:
c.l. wks. solid, 76%, cwt. ..... 3.20 / 3.35
flak. & grd. 100 lb. drums ..... 3.60 / 3.75
liquid 50% tanks ..... 2.40 / 2.55
liquid 70% tanks ..... 2.50 / 2.65

China clay:
dom. air float, filler, c.l. wks.
ton 10.00
water washed 11.00
coating ..... 16.00 /20.00
imported, ex whse., short ton 15.20 /28.35

Chlorine:
single unit tanks, works cwt. 2.55 / 2.70
multi-unit ..... cwt. 2.05 / 4.75

Formaldehyde:
USP, ink. dms. c.l. wks. ..... lb. .0570
c.l. E. wks. ..... .0620

Fuel oil:
Bunker C, No. 6 Cal. hvy
tanks, refinery ..... bbl. 1.25 / 1.55
light ..... bbl. 1.65 / 2.10

Hydrogen peroxide:
USP, 35% cbys. E. of Miss.
lb. .23½

Lime:
hydrated, bags, wks. Buffalo
ton 13.50

Rosin:
B gum, drms, c.l. Savan. ..... cwt. 4.10
G, H, I, do. ..... cwt. 6.45
K, do. ..... cwt. 6.51
FF wood, do. ..... cwt. 5.00

Rosin size:
70%, gum & pale grds, tank
cars, south, sh. pt. ..... cwt. 5.35 / 5.75

Salt cake:
dom. bulk, c.l. contract del'd
ton 18.00 /20.00
wks. frt. all. ..... ton 22.00 / —

Soda ash:
light, 58%, bags, wks. ..... cwt. 1.35 / 1.50
bulk ..... cwt. 1.10 / 1.20

Sodium silicate 40°:
turbid, c.l. wks. ..... cwt. 1.10
t.c.l. wks. ..... 1.30 / 1.40

Sodium peroxide:
dms. c.l. E. of Miss. ..... lb. .18
l.c.l. do. ..... lb. .18½/ .19

Soybean, protein:
chem. isol. wks. c.l. ..... lb. .24 / —
Cinn. and Chic.

Sulfuric acid:
60° Be. cbys. c.l. ..... cwt. 1.40
E. wks.
L.c.l. ..... cwt. 1.80 / 2.50

Sulfur:
crude, c.l. mines, contract,
long ton 18.00
f.o.b. vessels Gulf 19.50
Export, f.o.b. Gulf 22.00

Sulfur dioxide:
liquid, comL cyl. wks. ..... lb. .09
multi-unit cars ..... lb. .0535

Starches:
pearl corn, bags, c.l. Chic. cwt. 5.47 / —
white dextrines, c.l. Chic. cwt. 6.74 / —
potato, Idaho, c.l. wks. ..... cwt. 5.25 / —
potato, Maine, c.l. wks. ..... cwt. 5.25 / —
tapioca, conv. dextrines ..... cwt. 6.75 / 7.25
medium grds. Gulf and East
Coast ports ..... 5.50 / 6.25
low, Starc. on dock N. Y. ..... 4.75 / 5.25

Talc:
domestic, 50-lb. sacks, c.l.
wks. ..... ton 23.00 /28.00

Titanium dioxide:
anastase, c.l. dedl., bags ..... lb. 19½
l.c.l. dedl. ..... lb. .20
rutile, c.l. dedl. ..... lb. 21½
l.c.l. dedl. ..... lb. .22½

N.B.: For special market conditions, see *Trends*.

IMPORTS AT NEW YORK
Two Weeks Ending Sept. 9

Newsprint
(.....), Fort Avalon, Cornerbrook, 2309 rolls.
R. A. Olsen, G.T.D., Donnacona, 370 rolls.
Montmorency Paper Co., Storfjeld, Botwood, 4638 rolls.
News Syndicate Co., Monta Alta, Dalhousie, 8595 rolls.
R. A. Olsen, Donpaco, Donnacona, 347 rolls.
News Syndicate Co., Ted, Thorold, 2323 rolls.
News Syndicate Co., Mimi, Thorold, 2391 rolls.
Madden Reeve Angel & Co., Inc., Mormacrio, Kotka, 97 rolls.
News Syndicate Co., Ethel Tombs, Gatineau, 293 rolls.
H. C. Craig Co., Newscarrier, Donnacona, 340 rolls.
R. A. Olsen, G.D.D., Donnacona, 413 rolls.
H. C. Craig Co., A.C.D., Donnacona, 345 rolls.
R. A. Olsen, Kermic, Donnacona, 391 rolls.
N. Y. Journal American, Markland, Liverpool, N.S., 613 rolls.
N. Y. Herald Tribune, Markland, Liverpool, N.S., 1838 rolls.
N. Y. World Telegram, Markland, Liverpool, N.S., 538 rolls.
N. Y. Daily Mirror, Markland, Liverpool, N.S., 210 rolls.
Brooklyn Daily Eagle, Markland, Liverpool, N.S., 678 rolls.
Brooklyn Eagle Press, Markland, Liverpool, N.S., 75 rolls.
W. D. Peck, Markland, Liverpool, N.S., 1078 rolls.
Trade Union Service, Inc., Markland, Liverpool, N.S., 60 rolls.
H. D. Gonzales, Markland, Liverpool, N.S., 254 rolls.
Advance Pattern Co., Markland, Liverpool, N.S., 40 rolls.
Price & Pierce, Ltd., Markland, Liverpool, N.S., 149 rolls.
Richmond Newspapers, (Richmond, Va.), Markland, Liverpool, N.S., 1629 rolls.
Pepper Printing Co., (Richmond, Va.), Markland, Liverpool, N.S., 69 rolls.
W. D. Peck, (Richmond, Va.), Markland, Liverpool, N.S., 69 rolls.

Tissue Paper
B. F. Drakenfeld & Co., Britannic, Liverpool, 33 cs.
B. F. Drakenfeld & Co., Medic, Liverpool, 25 cs. (potters).

Parchment Paper
Gerhard & Hey, Washington, Southampton, 1 cs.

Writing Paper
Dempsey & Carrol, Washington, Havre, 3 cs.
D. C. Andrews & Co., Ile de France, Havre, 3 cs.
Metasco, Inc., Ile de France, Havre, 2 cs.
H. W. Robinson & Co., American Scientist, London, 1 cs.

Gummed Paper
B. F. Drakenfeld & Co., American Builder, Liverpool, 47 cs.

Wallpaper
C. A. Haynes & Co., American Builder, London, 586 ctns.
Liebermann & Waelchli, L. Maersk, Yokohama, 5 cs.
S. K. Lonergan, Gripsholm, Gothenburg, 40 cs.
C. R. Gracie & Son, Reinholt, Taku Bar, 19 cs.
Hudson Shipping Co., Domfront, Havre, 2 cs.
J. D. Smith, Domfront, Havre, 3 cs.
S. K. Lonergan, Stockholm, Gothenburg, 12 cs.

Printing Paper
M. Grundbacher, Gertrude Maersk, Rouen, 21 bls.
Olympic Shipping Co., Gertrude Maersk, Rouen, 32 cs.

Kraft Paper
Parsons & Whittemore, Inc., African Prince, 99 rolls.

Carbon Paper
Mahler Trading Co., Aalelyk, Rotterdam, 41 bls.

Transparent Paper
M. J. Corbett & Co., Aalelyk, Rotterdam, 20 cs.

Sulphite Paper
B. M. Heede, Oslofjord, Oslo, 6 bls.

Filter Paper

J. R. Bernard & Co., Gripsholm, Gothenburg, 4 cs.

H. Reeve Angel & Co., Inc., American Scientist, London, 16 cs

Wrapping Paper

Chemical Bank Trust Co., Gripsholm, Gothenburg, 45 rolls.

Jay Madden Corp., Mormacrio, Helsingfors, 191 rolls.

Wallboard

Elof Hansson, Inc., Gripsholm, Gothenburg, 232 bdls.

Elof Hansson, Inc., Stockholm, Gothenburg, 569 ctns.

Plywood & Door Manufacturing Corp., Mormacrio, Helsingfors, 315 bls.

Miscellaneous Paper

Coty, Inc., De Grasse, Havre, 7 cs.

Jay Madden Corp., Mormacrio, Helsingfors, 166 rolls.

Rags, Baggings, Etc.

E. J. Keller Co., Inc., American Builder, Manchester, 81 bls. bagging.

A. Siegle Corp., American Builder, Manchester, 188 bls. jute waste.

Chase National Bank, American Builder, Manchester, 70 bls. old bagging.

Loumar Textile By Products, American Builder, Manchester, 48 bls. old bagging.

(———), Hay, Alexandria, 53 bls. rags.

D. Benedetto, Gertrude Maersk, Rouen, 75 bls. rags.

A. de Vries Trading Corp., Gertrude Maersk, Rouen, 125 bls. rags.

Robbins Forwarding Co., Gertrude Maersk, Rouen, 66 bls. rags.

A. de Vries Trading Corp., Boradis, Genoa, 85 bls. bagging.

Irving Trust Co., Borealis, Genoa, 225 bls. bagging waste.

H. Adlerstein, Enrico C., Genoa, 98 bls. rags.

National City Bank, African Prince, London, 58 bls. sisal strings.

E. J. Lang, African Prince, London, 55 bls. old jute bagging.

Manufacturers Trust Co., African Prince, London, 51 bls. cotton rags.

(———), Aalsdyk, Rotterdam, 83 bls. old jute rags.

F. Lassauer, American Eagle, Bremen, 104 bls. jute rags.

Loumar Textile By Products, American Eagle, Rotterdam, 58 bls. old jute bagging.

Midwest Waste Materials Co., American Eagle, Rotterdam, 118 bls. scrap bagging.

A. de Vries Trading Corp., City of Derby, Melbourne, 13 bls. rags.

(———), American Scientist, London, 208 bls. scrap jute bagging.

Castle & Overton, Inc., American Scientist, London, 34 bls. new cuttings.

(———), Mohamed Ali el Kebir, Alexandria, 32 bls. flax thread waste, 16 bls. hemp cuttings.

National City Bank, Mohamed Ali el Kebir, Alexandria, 48 bls. bagging.

THE H. K. FERGUSON COMPANY

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Complete Service for Design, Construction, Equipment Installation, Engineering Reports and Surveys

Executive Offices
Ferguson Building, Cleveland

District Offices
19 Rector St., New York, M & M Bldg., Houston, 120 S. La Salle St., Chicago, 2975 San Fernando Road, Los Angeles, 21 E. 12th St., Cincinnati

A. de Vries Trading Corp., Mohamed Ali el Kebir, Genoa, 187 bls. scrap bagging.

Madden Reeve Angel & Co., Inc., Mormacrio, Kotka, 64 rolls paper waste.

(———), Port Huron, London, 123 bls. old bagging.

Casein

East Asiatic Co., Arendsdyk, Buenos Aires, 500 bags (lactic).

Chase National Bank, Ribiera Grande, Ponta del Gada, 400 bags (lactic).

The Borden Co., Chemical Division, Ribiera Grande, Ponta del Gada, 430 bags (rennet).

The Borden Co., Chemical Division, Uruguay, Buenos Aires, 1800 bags (lactic).

New York Trust Co., Uruguay, Buenos Aires, 2000 bags (lactic).

E. Lang, Uruguay, Buenos Aires, 745 bags (lactic).

Tupman Thurlow Co., Uruguay, Buenos Aires, 1000 bags (lactic).

American Cyanamid Co., Uruguay, Buenos Aires, 2200 bags (lactic).

Wilbur Ellis, Uruguay, Buenos Aires, 1400 bags (lactic).

Crawford & Co., Uruguay, Buenos Aires, 1700 bags (lactic).

Crawford & Co., Bowgran, Buenos Aires, 1000 bags.

E. M. Sargeant Pulp & Chemical Co., City of Derby, Melbourne, 600 bags (rennet).

Manufacturers Trust Co., Domfront, Havre, 200 bags.

Crawford & Co., Mormacdove, Buenos Aires, 300 bags (lactic).

The Borden Co. Chemical Division, Mormacdove, Buenos Aires, 700 bags (lactic).

F. H. Paul & Stein Bros., Mormacdove, Montevideo, 200 bags (lactic).

Woodpulp

Price & Pierce, Ltd., Oxlefjord, Oslo, 375 bls. sulphite pulp.

Price & Pierce, Ltd., Markland, Liverpool, N.S., 915 bls. unbleached sulphite pulp.

Perkins Goodwin & Co., Stockholm, Gothenburg, 504 bls. woodpulp.

Old Rope & Cordage

(———), Eucadia, Glasgow, 84 bls., 42 coils.

Cardboard

F. C. Strype, Aalsdyk, Rotterdam, 22 cs.

E. I. Du Pont de Nemours & Co., American Scientist, London, 6 cs (baryta coated).

Jay Madden Corp., Mormacrio, Helsingfors, 149 rolls.

Litho Paper

Fuchs & Lang Manufacturing Co., Willamette Victory, Hong Kong, 50 cs.

Baryta Paper

W. Reimerdes, American Scientist, Bremen, 11 cs.

Drawing Paper

H. Reeve Angel & Co., Inc., American Scientist, London, 1 cs.

Milk Paper

Premier Shipping Co., Stockholm, Gothenburg, 4 rolls.

Boxboards

General Motors Overseas Operations, Stockholm, Gothenburg, 36 bdls.

Photo Paper

J. J. Gavin & Co., Queen Mary, Southampton, 3 cs. (unsensitized).

Alco Photo Supply Corp., Queen Mary, Southampton, 10 cs.

A. A. Thompson, Port Huron, London, 1 cs.

Crepe Paper

Durex Co., Media, Liverpool, 1 roll

Woodpulp Boards

Parsons & Whittemore, Inc., Stockholm, Gothenburg, 88 bls., 548 rolls.

Jay Madden Corp., Mormacrio, Kotka, 435 bls.

Woodflour

J. Kennedy, Mormacrio, Helsingfors, 2 cs.

IMPORTS AT WILMINGTON

Two Weeks Ending Sept. 9

Ludlow Manufacturing & Sales Co., City of Calcutta, Chittagong, 500 bls. waste jute ropes.

IMPORTS AT NEWARK

Two Weeks Ending Sept. 9

Cellulose Sales Co., Uddeholm, Sandarne, 165 bls. air dry sulphite pulp.

Cellulose Sales Co., Uddeholm, Ortviken, 1020 bls. dry sulphite pulp.

Cellulose Sales Co., Uddeholm, Ostrand, 934 bls. kraft sulphate pulp.

Gottesman & Co., Inc., Uddeholm, Ostrand, 960 bls. unbleached strong sulphite pulp.

Cellulose Sales Co., Uddeholm, Kramfors, 1050 bls. sulphite pulp.

Perkins Goodwin & Co., Uddeholm, Kramfors, 609 bls. strong sulphite pulp.

IMPORTS AT ALBANY

Two Weeks Ending Sept. 9

Perkins Goodwin & Co., Uddeholm, Norrsundet, 1120 bls. dry sulphite pulp.

Pagel Horton & Co., Inc., Uddeholm, Norrsundet, 1000 bls. dry sulphite pulp.

Price & Pierce, Ltd., Uddeholm, Wallvik, 3810 bls. dry pulp.

Cellulose Sales Co., Uddeholm, Sandarne, 330 bls. air dry sulphite pulp, 500 bls. air dry sulphate pulp.

Cellulose Sales Co., Uddeholm, Ortviken, 300 bls. dry sulphite pulp.

Cellulose Sales Co., Uddeholm, Ostrand, 180 bls. dry sulphite pulp, 1950 bls. kraft sulphate pulp.

Cellulose Sales Co., Uddeholm, Kramfors, 450 bls. sulphite pulp, 450 bls. sulphate pulp.

IMPORTS AT BOSTON

Two Weeks Ending Sept. 9

E. Butterworth & Co., Inc., American Builder, Manchester, 103 bls. old bagging.

Stone & Downer Co., American Builder, Liverpool, 10 drums gummed paper.

E. Butterworth & Co., Inc., American Builder, Liverpool, 62 bls. bagging.

J. A. Conkey, American Builder, Liverpool, 1 cs. gauze carbonizing tissue.

Elliott Addressing Machine Co., Pioneer Bay, Kobe, 26 cs. tengujo paper.

Atlantic Gelatine Division, Aalsdyk, Rotterdam, 440 bags casein.

Oxford Paper Co., Aalsdyk, Rotterdam, 367 bags lactic casein.

East Asiatic Co., Arendsdyk, Buenos Aires, 500 bags lactic casein.

Wilbur Ellis, Bowgran, Buenos Aires, 600 bags casein.

Manufacturers Trust Co., Exanthia, Casablanca, 155 bls. gluestock.

Hartog Ruf, Exanthia, Trieste, 109 rolls wrapping paper.

(———), Mormacdove, Buenos Aires, 255 bags lactic casein.

IMPORTS AT PHILADELPHIA

Two Weeks Ending Sept. 9

Leigh Textile Co., American Builder, Manchester, 217 bls. bagging.

Perkins Goodwin & Co., Uddeholm, Norrsundet, 750 bls. dry sulphate Pulp.

Cellulose Sales Co., Uddeholm, Sandarne, 750 bls. air dry sulphate pulp.

Cellulose Sales Co., Uddeholm, Ortviken, 259 bls. sulphite pulp, 1824 bls. dry sulphite pulp.
Cellulose Sales Co., Uddeholm, Kramfors, 1308 bls. sulphite pulp, 162 bls. sulphate pulp.
Gottesman & Co., Inc., Uddeholm, Kramfors, 426 bls. strong sulphite pulp.
Cellulose Sales Co., Uddeholm, Ostrand, 368 bls. dry sulphite pulp, 2256 bls. kraft sulphate pulp.
E. J. Keller Co., Inc., Gertrude Maersk, Rouen, 115 bls. old cotton rags.
Belmont Burlap Bag Co., Gertrude Maersk, Rotterdam, 150 bls. old bags.
Gottesman & Co., Inc., Uddeholm, Ostrand, 426 bls. unbleached sulphite pulp.
Jay Madden Corp., Mormacrio, Helsingfors, 84 rolls sulphate wrapping paper.
Madden Reeve Angel & Co., Inc., Mormacrio, Kotka, 1469 rolls newsprint.
China American Paper & Pulp Corp., Expeditor, Trieste, 547 bls. chemical pulp.
Gottesman & Co., Minnesota, Iggesund, 647 bls. bleached kraft.
Gottesman & Co., Minnesota, Iggesund, 249 bls. Semi Bleached Kraft.

IMPORTS AT BALTIMORE

Two Weeks Ending Sept. 9

S. Shapiro & Son, Flying Independent, Osaka, 12 bls. rags.
(illegible)-1, Ronda, Havre, 144 bls. old clothes.
Plywood & Door Manufacturing Corp., Mormacrio, Helsingfors, 315 bls. wallboard.
Jay Madden Corp., Mormacrio, Helsingfors, 164 rolls sulphate wrapping paper.
Madden Reeve Angel & Co., Inc., Mormacrio, Kotka, 507 rolls newsprint.
Pulp Sales Corp., Mormacrio, Kotka, 205 rolls paper waste.

IMPORTS AT NORFOLK

Two Weeks Ending Sept. 9

R. J. Reynolds Tobacco Co., Ronda, Havre, 75 cs. cigarette paper.
1st National Bank of Boston, Exanthia, Venice, 73 bls. old jute bagging.

NEW LITERATURE

Economic Cooperation Administration, Special Mission to France. Booklet, "Trade With France—A Businessman's Guide and Directory."

The B. F. Goodrich Co. Catalog 9160, "Adhesives." Describes each adhesive, with recommended uses, methods of application.

Goulds Pumps, Inc. Bulletin 636.1, "Goulds Self-Priming Centrifugal Pumps." Sales and technical copy.

Gould Storage Battery Corp. Announces six new specifications sheets for motive power batteries.

Hewitt-Robins, Inc., Robins Conveyors Div. Bulletin No. 134, "The Hewitt Robins Vibra-Feeder." Bulletin No. 135, "The Hewitt Robins Vibra-Veyor."

Hanchett Mfg. Co. Book, revised edition, 472 pp., illustrated, price $5.50, "Hanchett Saw and Knife Fitting Manual." Contains chapters on knife and shear blade grinding, etc.

The Jeffrey Co. Booklet, "What We Make." Thumbnail sketches of manufacturer's line of processing equipment, transmission machinery and related equipment.

Hall Laboratories, Inc. Booklet, "Your Most Important Raw Material." Discusses treatment for industrial water problems.

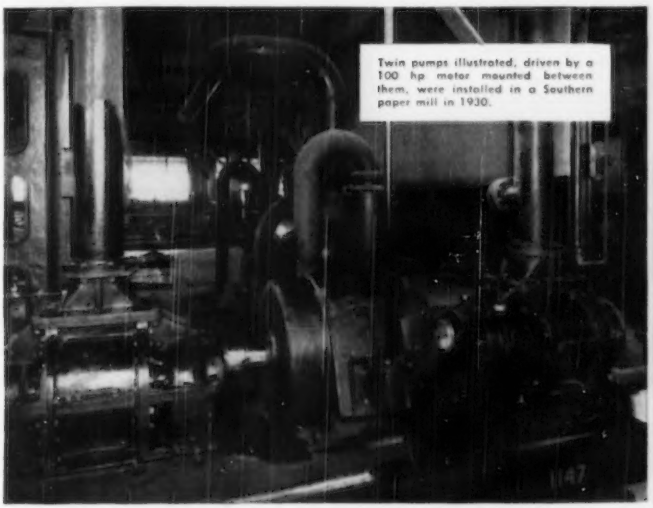
Maurice A. Knight Co. Bulletin, "Permanite Acid and Alkali-Proof Pipe and Fume Ducts." Technical copy.

Leeds & Northrup Co. Folder N-91 (1a), "Here's Process-Proven Micromax Equipment." Describes SO_2 equipment.

Lyon-Raymond Corp. Bulletin 241, "Low Cost Hydraulic High Lift Truck." Specification and construction details on 1000 lb. capacity truck.

Link-Belt Co. Book No. 2274, 88 pp., "Link-Belt P.I.V. Variable Speed Drives." Features convenience of selection in 36 pages of "Preselected Drives."

Metallizing Engineering Co., Inc. Bulletin 57B 30M6/50, "New Bearing Surface Material Outwears Old As Much As 25 Times." Describes Sprabond Wire.


Twin pumps illustrated, driven by a 100 hp motor mounted between them, were installed in a Southern paper mill in 1930.

HAVING SLIDE RULE TROUBLE?

If it concerns vacuum pumps, you'll find a solution in the ROOTS-CONNERSVILLE wide line of standard sizes.

Roots-Connersville has been supplying Vacuum Pumps to paper mills for many years, for use on suction rolls, flat boxes, and felt conditioners. Satisfied users long since discovered these important advantages:

High Volumetric Efficiencies—accurately maintained clearances, effectively sealed by water, insure high efficiencies; air being handled can be dry, or contain vapors or liquids.

Low Friction Losses—due to no contact between impellers or impellers and casings.

High Speeds—permitting direct connection to standard motors, saving first cost, space and weight.

Flexibility—to meet varying vacuum requirements; suction automatically created to overcome resistance in system.

Durability and Dependability—simplified design and construction for long-time, attention-free operation.

Solve your vacuum pump problems permanently by consulting with Roots-Connersville on any requirement, for new installations or replacements.

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BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER AND PRODUCTION RATIO REPORT

(Production as percent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

	Aug. 5	Aug. 12	Aug. 19	Aug. 26	Sept. 2
1950	106.5	103.9	105.6	107.0r	106.2
	Aug. 6	Aug. 13	Aug. 20	Aug. 27	Sept. 3
1949	*85.5*	*85.9*	*89.1*	*90.3*	*89.3*

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1949	*94.6*	*92.8*	*89.1*	*85.1*	*82.7*	*78.6*	*72.8*	*87.6*	*89.7*	*96.9*	*98.2*	*89.8*	*88.0*
1950	97.6	101.1‡	102.6‡	100.9‡	101.8‡	103.2‡	90.8‡	105.8‡					

r Revised.
‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1943	1944	1945	1946	1947	1948	1949	1950
Year to Date	87.9	87.5	87.7	99.8	103.3	97.4	85.8	100.8
Year Average	87.8	88.1	89.4	100.1	104.3	96.2	88.0	

PAPERBOARD OPERATING RATIOS†

	Aug. 5	Aug. 12	Aug. 19	Aug. 26	Sept. 2
1950	99	99	101	100	
	Aug. 6	Aug. 13	Aug. 20	Aug. 27	Sept. 3
1949	*82*	*84*	*87*	*86*	*89*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1949	*88*	*85*	*79*	*79*	*78*	*75*	*64*	*86*	*87*	*94*	*93*	*83*	*81*
1950	88	92	91	92	91	94	82	100					

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Walter Grasbeck Named KBE

LONDON, England—King George VI has bestowed upon Walter Grasbeck, managing director of the Finnish Cellulose Association the title of Knight Commander of the British Empire. This is an honor seldom bestowed upon persons outside the British Empire and emphasizes the great services rendered by Sir Walter in fostering trade and friendly relations between Finland and the Empire.

Strike at Bird & Son

BOSTON, Mass.—Approximately 2,000 employes of Bird & Son, Inc., are out on strike. At 3:00 p.m. on August 31, the employes at the paper mill and box shop at East Walpole and the roofing and floor covering plants at Norwood walked off their jobs. There had been a meeting called on short notice, at the request of the unions, between their committee and such members of the company's administrative committee as were available. At this meeting the unions, for the first time, presented directly to the administrative committee their position on the pending issues including a demand for 15 cents wage increase.

A. H. Anderson, president of the company, assured the unions that their case would be presented to the full administrative committee at its meeting early the next week, after which an immediate reply would be given to the unions.

The striking unions are Local Industrial Union 1330, CIO; Local 896, United Paper Workers of America, CIO; and Local 385, United Rubber Workers of America.

After a three-hour conference in Social Hall in the Civic Building, Norwood, on September 6, between representatives of management, representatives of four unions, and members of the State Board of Conciliation and Arbitration, no agreement was reached. No date was set for another meeting.

Supts. Move Headquarters

The American Pulp and Paper Mill Superintendents Assn., Inc., as of September 1, 1950, has established its headquarters office in Chicago, Ill. The former headquarters office in New York City, which was opened in 1944, was closed as of the September 1 date.

The new headquarters location is that of the former branch office: Room 1426, 111 West Washington street, Chicago 2, Ill. The telephone number is FInancial 6-0960.

Harry E. Weston, formerly associate secretary-treasurer, now secretary-treasurer, is in charge.

Sullivan Resigns from Gould

Edward J. Sullivan announces his resignation as eastern sales manager of Gould Paper Co., a subsidiary of Continental Can Co., 100 East 42nd street, New York City, effective October 15.

OBITUARIES

Henry L. Fernette, 67, Saginaw, Mich., owner of the Fernette Box Co., died after a two-month illness. Survivors include his widow, Florence; a brother, and three sisters.

William Murdock Robertson, 69, Chief of the Research Division of the Canadian Government's Forest Service until his retirement three years ago, died in Ottawa after a lengthy illness.

After his retirement from the Government's service, he acted as advisor to the Anglo-Newfoundland Development Co. and the Bowater Co. both of Newfoundland.

He is survived by his widow, five sons and one daughter.

C. B. Smith, 64, passed away on September 6. Mr. Smith early associated himself with the papermaking industry. He was the sales representative in the Kalamazoo area for the Noble & Wood Machine Co., Hoosick Falls, N. Y., at the time of his death. Previous to his connection with Noble & Wood he had sold dyestuffs and starch to the industry.

Mr. Smith was a member of the Superintendents Ass'n. He was particularly active in the affairs of its Michigan Division, having served on three of its committees and also as its Allied Industrial Affiliate representative.

He is survived by his widow, Mildred W.; and one sister, Mrs. Lloyd Walker.

Fred H. Woods, who retired August 1, after serving the Graham Paper Co. for 38 years as salesman, died in Los Angeles during a visit. He is survived by two sons and two daughters.

G. Harold Young, 48, one of the outstanding authorities on paper drying in the paper and textile industries, vice-president and chief engineer of the Midwest-Fulton Machine Co., of Dayton, Ohio, passed away at Good Samaritan Hospital, Dayton on September 5, as the result of an operation.

Mr. Young, was a graduate of the University of Cincinnati. After graduation he joined the Fulton Engineering Co. of Middletown, where his experience in designing drying systems began. When the Fulton Engineering Co. was merged into the Midwest-Fulton Machine Co. in 1930, he became associated with the new organization, as chief engineer. In 1945 he was elected a Director and vice-president of the company.

Mr. Young was responsible for many important advances in the development of drying systems, with the result that there is hardly a paper mill in the United States which has not benefited from his experience and knowledge of drying.

His survivors include his widow and one son.

CLEARING HOUSE

HELP WANTED

MEN WANTED
POSITIONS OPEN

Manager for coated paper converting and printing plant; Managers and superintendents for mills making high-grade book, bond, ledger and offset papers, also roofing felt, asbestos cement and boxboard.

Beater engineers; chemists, chemical engineers, also laboratory assistants; millwright foreman; machine tenders and back tenders.

We invite correspondence (confidential) with mills seeking executives and with executives seeking new positions.

CHARLES P. RAYMOND SERVICE, INC.
294 Washington St., Boston, Mass.

ENGINEERING DRAFTSMEN AND DETAILERS

Several required—experience in Paper Mill machinery or heavy equipment preferred. Permanent positions—State qualifications and salary expected.

The Appleton Machine Company
Appleton, Wisconsin

S-14

SALARIED POSITIONS $3,500—$35,000
If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (40 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Dun Bldg., Buffalo 2, N. Y.
TF

MILL IN THE EAST

starting up a new cylinder machine to run Tissue paper needs Machine Tenders and Back Tenders. Give Reference. Apply Box 50-403. Care Paper Trade Journal.

S-14

BEATER ENGINEER AND MACHINE TENDER—Southern mill manufacturing folding and set-up boards. Good pay for thoroughly experienced man. Address Box 50-409 care Paper Trade Journal. S-14

HELP WANTED

WANTED—Shipping Superintendent. To warehouse and ship paper bags, rolls, sheets and miscellaneous paper products. Must be able to direct labor efficiently and economically. The opportunity is in large mill in Southeast. Climate excellent. When applying state full qualifications, experience, education and references. Address Box 50-449 care Paper Trade Journal. S-14

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Paper converting, nationally known. Printing, coating, gumming, laminating, finishing operations. Lifetime position for top-flight production executive. Our people know of this ad. Send full details confidentially to President, Box 50-443, care Paper Trade Journal. TF

BOSS MILLWRIGHT

Middle West paper mill has opening for man age 30 to 45. Prefer man with some technical background and plenty of practical experience. Excellent opportunity. Replies confidential. Write complete personal and business history to Box 50-412 care Paper Trade Journal. S-21

ASSISTANT SUPERINTENDENT

Wisconsin tissue mill has opening for assistant superintendent. Combination of technical training and machine experience preferred, but all applicants will be considered. Replies confidential. Write Box 50-410 care Paper Trade Journal. S-21

WORKING SUPERINTENDENT for small, fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 50-378 care Paper Trade Journal. TF

LARGE PAPER MACHINERY MANUFACTURER interested in securing services of an assistant superintendent of machine shop, also erecting men for shop and field work. In reply, please state age and experience. Address Box 50-435 care Paper Trade Journal. S-21

WANTED—Master Mechanic thoroughly familiar with Board Mill operation. Excellent opportunity for right man. Please give full particulars in first letter. Address Box 50-428 care Paper Trade Journal. S-28

WANTED—Experienced Welder for Board Mill. Only men interested in a permanent position with a growing concern need apply. Good working conditions and good hourly rate. Address Box 50-429 care Paper Trade Journal. S-28

WANTED — Experienced Machine Tender, Backtender and Beater Engineer, for cylinder machine, making all grades of folding box and .016 test liner. Give resume of past experience, reference and age in first letter. Address Box 50-430 care Paper Trade Journal. S-14

HELP WANTED

WANTED—YOUNG MAN, 30, 40, technical graduate, experienced supervising operations of Paper or Roofing Felt Mill, wanted for position of superintendent with nationwide, progressive building materials manufacturer. State age, experience, education etc., in letter to Box 50-422 care Paper Trade Journal. S-14

EXPERIENCED PAPER MILL ENGINEER, with knowledge of general engineering work in consulting engineer's office, specializing in pulp and paper mills. Excellent opportunity for right man. State complete details, age, experience, availability and salary desired. Address Box 50-442 care Paper Trade Journal. S-28

SUPERINTENDENT AND GENERAL MANAGER for Southern Folding Board Mill. Must be thoroughly experienced, quality and maintenance conscious and possess executive ability to supervise purchasing and cost controls. Excellent compensation—secure future. Address Box 50-408 care Paper Trade Journal. S-14

SITUATIONS WANTED

EXECUTIVE ACCOUNTANT

Capable organizational and supervisory ability. 20 years administrative experience in folding carton, paperboard and printing industry. Available immediately. Box 50-540 care Paper Trade Journal. S-21

EXPERIENCED
KRAFT PULP AND PAPER MILL ENGINEER AND OPERATOR

wants to contact mills.

Cement Sacks, Gumming, Envelopes and other Specialties.

Address Box 50-439 care Paper Trade Journal. N-2

RESEARCH DIRECTOR—20 years experience in peace and wartime Research, Production, Manufacturing, paper converting, synthetic coatings, adhesives, decorative, ordnance, functional, building, industrial, anti-corrosive papers, foodwraps, imagination, know how, initiative, *products, processes seeking new responsibilities with well established company in Research Management. Address Box 50-436 care Paper Trade Journal. *pat. pend.
S-21

OVER TWENTY YEARS EXPERIENCE in finishing department with specialties and fine papers. Middle aged, reliable, seeking advancement to foreman or assistant superintendent. Prefer central location. Address Box 50-441 care Paper Trade Journal. S-14

TOUR BOSS—Thoroughly experienced on Test Liner and all grades of Boxboard. Good references. Address Box 50-437 care Paper Trade Journal. S-21

MASTER MECHANIC—25 years practical experience in maintenance and construction of several plants, also engineering training. Age 43. Best references. Address Box 50-418 care Paper Trade Journal. S-21

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HELP WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

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PLANT MANAGER—Board and Paper Conversion; employed; seeks opportunity in company needing cost-minded executive with proven production record and excellent labor relations history. Address Box 50-385 care Paper Trade Journal. S-28

SALES EXECUTIVE — 48, Member T.A.P.P.I., S.A.P.I., wide acquaintance with publishers, Converters, Merchants, Printers. Experienced Book, Bond, Coated, Groundwood, Sulphate. Capable manager. Personable, Aggressive. Available October 15. Address Box 50-404 care Paper Trade Journal. TF

GRADUATE CHEMIST — Technologist. 14 years experience research development technical control in coarse papers and board. Desires laboratory or mill position. Any location. Immediate availability. Address Box 50-417 care Paper Trade Journal. S-21

SUPERINTENDENT—27 YEARS OF PRACTICAL EXPERIENCE on Fourdrinier and Cylinders, manufacturing the following grades: all kinds sulphite, groundwood, kraft specialties and de-inking old papers for high grades, all kinds of folding box board. Can get you quality and production. Best of references. Address Box 50-406 care Paper Trade Journal. S-21

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PAPER CONVERTING CHEMIST—15 years experience in Gumming, Waxing, Printing and Bag Making. Production of lacquered and hot melt coated grades; Adhesives; Food Wrappers; Functional and Decorative Papers. Experience in paper manufacturing, foil and cellophane converting. Seeking new responsibilities with well established, progressive connection in production or sales. Address Box 50-447 care Paper Trade Journal. S-21

FOR SALE

FOR SALE:—Hudson-Sharp folding machine complete with dual backstand, electrical equipment, automatic counter. Takes paper 20" wide, 24" rolls. Unfolded sheet 20" x 30", folded sheet 10" x 15", 10" x 10", 10" x 7½". May be seen in operation.

Address Box 50-405 care Paper Trade Journal S-21

FOR SALE—Model M-3, 1 H.P. "LIGHTNIN" Portable Mixer. DELTOX RUG CO., Oshkosh, Wisconsin. S-21

FOR SALE

FOR SALE

100" Horne single knife Sheeter with back-stand.
64" Hamblet Sheeter with Layboy and back-stand.
58" Finley Sheeter.
36" Hamblet Sheeter.
74" Beloit 2-drum Rewinder.
48" Kidder model CH Slitter.
32" Cameron model 24-3A Slitter.
2—Three-color Rotary Printing Presses, 60" wide.
Cottrell 3-color Bag Press.
Flat Cutters, 32", 38", and 44" Power Machines.

Also many good values in Printing, Newspaper & Lithographing Equipment.

THOMAS W. HALL COMPANY, Inc.
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FOR SALE—600—8 x ¼ x 82 Paper Cores—$500.00 per thousand—EXCELLO PAPER PRODUCTS CO., 3351 Madison Road, Cincinnati, Ohio. S-14

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For outright purchase—
Paper Machines, Paper Mill Machinery and Converting Equipment.

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY

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1—Dayton High Speed—iron tub—60 tons per day.

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87 feet 8" 13 ply Goodyear Rubber Belting.
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177 feet 10" 6 ply Silver Duck Transmission Belt.

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8—Blowers and Mill Exhausters.

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46 Chilled Iron Rolls—Assorted sizes.

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1—112" face 7 roll.

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1—18½ ft. long x 30" wide—with motor.

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1—Cameron with 1" x 1½" mandrels.

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1—134" face x 36" diameter, with stainless steel shafts.
1—74" face x 36" diameter.

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5—143" face x 48" diameter.
5—124" face x 48" diameter.
5—80" face x 36" diameter.
1—72" face x 48" diameter—with gear.
1—64" face x 36" diameter.
1—120" face x 16" diameter—Baby Dryer.
82—120" face x 42" diameter.
5—96" face x 36" diameter.
1—102" face x 48" diameter, with bearings.
1—94" face x 48" diameter—with gears and bearings.
3—100" face x 48" diameter—with gears and bearings.

ELECTRIC PAPER MACHINE DRIVES
1—G. E. 35/110 with G. E. Generator, Exciter and Controller.
1—G. E. 80/100 with G. E. Generator, Exciter and Controller.

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1—Beloit—4 plate.

FOURDRINIER SECTIONS
1—P & J 156" x 80 ft. ball bearing. Complete from Inlet to 22" diameter suction couch. Brass and Rubber covered table rolls, 6 Brass Suction Boxes operated at 1000' per minute.

HYDRAFINER
1—Ditts Hydrafiner with anti-friction bearings—200 h.p. motor.

INLETS
1—96" All bronze—adjustable.

JORDANS
1—#3 Miami, for motor drive.
1—Jones Majestics with base and couplings—
2—#3 Appleton with base and coupling.
1—Dilion Horne, Stainless steel ⅝" filling.
1— Jones Majestic, Stainless Steel Filling.

MOTORS
1—Reliance 25 h.p. ball bearing, 550 v., 3 phase, 60 cycle—1750 r.p.m.

PULLEYS
30—Split cast iron tapered Pulleys.

PULP EQUIPMENT
1—Mitts & Merrill #17 Pulpwood chipper.
1—96" Murray 4 knife ball bearing Chipper, with 150 h.p. synchronous motor.

PUMPS
44—Centrifugal Pumps, open & closed impellers. Direct connected or Belt Driven. Extended base for motor. Assorted capacities and heads. Most used less than one year. Also new Goulds Pumps.
1—Worthington Sump Pump—75 g.p.m. 60' head with General Electric 2 h.p. 220-440 v. motor.
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1—Link Belt 40 h.p. Ratio 2.2-1, 500 r.p.m.-227 r.p.m.
1—Falk 25 h.p. Ratio 300-1, 900 r.p.m.-3 r.p.m.

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1—Beloit 110" two bowl Reel.
1—Beloit 132" two bowl upright reel.
1—Beloit 116" two bowl upright reel.

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32—Press rolls, brass and rubber covered.
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250—Brass and steel carrying rolls.

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1—#2 Leith-walk-ball bearing.
2—#2A Bird with Copper vats, enclosed drive.

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1—Valley Voith Screw Press Size 2A with new spare sets of plates.

SHEETERS
1—Hamblet 67" single knife with 8 roll backstand and 4 slitters.
1—Finlay 90" with 6 roll back stand, motor and 4 slitters.
1—42" Dillon with 8 roll backstand.
1—48" Kidder Spot Sheeter.

SHREDDERS
1—American 37" Hamermill, anti-friction bearing.
1—Sprout Waldron Cutter—type F-11—30" knives. Used 30 days.

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2—Pusey & Jones 160" high speed slitters and rewinders.
2—Langston 40" with motor and 25 sets shear cut slitters.
1—Langston 50" with 15 sets shear cut slitters.
1—Cameron 72" Model 6 36" rewind—20 knives.

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1—Shartle 8½x12 Triplex—Silent Chain Drive.
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1—Millspaugh 22" diameter x 138¾" suction face.
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1—Beloit 84" face x 18" diameter—ball bearing.

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1—66" Perkins 7 roll—with all electric equipment.

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1—62" Oswego.

VATS—STAINLESS STEEL
2—Dual Flow Stainless Steel vats for cylinders 48" diameter x 153" face—with stands for couches.

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1—Nash L-3.

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1—84" Wet machine—new vat.

FOR SALE

CAMERON SLITTERS

1—84" Type 10—Model 14. Late Type.

2—62" Type 9-S.

1—72" Type 9-S.

1—62" Shear cut, Type 6.

1—62" Type 6.

1—50" Shear Cut, Type 28, Model 3d.

1—42" Universal Type 6.

1—42" Type 26, Model 2A.

1—32" Type 40, Model 2A.

1—65" Kidder Late Type Super Speed Junior Model Shear Cut Slitter & Rewinder.

1—62" Waldron Shear Cut Slitter & Rewinder.

1—42" Johnstone Twelve Slitter & Rewinder.

1—Brand New 82" Johnstone Fourteen.

1—30" Fales Standard Model B Slitter & Rewinder.

POWER PAPER CUTTERS:

6—Seybold. 1—40" 10Z, 1—44" Precision Type, 1—54" Holyoke, 1—54" 20th Century. 1—60" 20th Century, 1—72" 20th Century, 3—Oswego, 44", 50" and 57", 2 Sheridan, 1—50", 1—65"; 2—Acme, 32 and 42"; 1—S&W Undercut, 63".

1—Hudson-Sharp 3 deck 10 x 10 Napkin Folding Machine. ¼, ⅛ & ⅛ Fold.

1—McCade Mfg. Co.'s facial tissue paper folding machine with AC motor. Production 40 to 50 gross in 8 hours. 400 count. 8" x 10".

1—Paper Converting Machine Co.'s single width towel folder, late model.

2—81" Dietz Toilet Paper Perforators. Sheets 4⅝ x 4⅝ and 4½ x 5 and paper towels perforated 7⅛ and 13⅝".

1—81" Hudson Sharp Toilet Perforator.

1—Paper Converting Machine Co. ¼ fold, 2 web napkin folder with embossing attachment, Extra Embossing rolls.

1—Pickett Garment Bag Machine, making bags 36" and 54".

6—Potdevin Bag machines with two color printing units. 1—Type 293, size 9693-303, flat and square bags. 4—Type 212 Size 9112-301, satchel bottom and flat bags, 3—Type 91 F&S Size 1, Flat and square bags.

1—32" 3-color Aniline Printing Press for tailprinter on a Bag Machine.

2—Duplex Sheeters, 1—64" Dillon and 1—94" Moore & White.

1—94" Dillion Duplex Rotary Sheet Cutter, with 24 roll back-stand and Brannan Ream Folder.

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1—45" German Dornbusch Embossing machine with two sets of embossing rolls.

1—72" & 1—84" Miami Lo-Type Waxing Machines.

1—80" Potdevin Waxing Machine. Model 79.

2—46" Waldron Brush Coating Machines complete with drying ovens, festoon equipment, rack and so forth.

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3—Noble & Wood Mammoth Jr. Jordans AC motors, direct connected.

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FOR SALE

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FOR SALE—At a substantial savings, 1 Huyck Top Felt, size 122" x 92", Brand new. Address Box 50-438 care Paper Trade Journal. S-14

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FOR SALE—36" Slitter & Rewinder Shear Cut with 3 Rewind Arms; 34", 64" and 96" Rotary Sheeters; 50" Seybold Paper Cutter; 28" x 41" Thomson Platen Die Cutter. Write for listing of over 90 Paper Converting Machines for sale. Address Box 50-392 care Paper Trade Journal. TF

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WANTED IMMEDIATELY FOR SPOT CASH
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SHEETER 64 to 72 Inch.
PAPER CUTTER 42 to 50 Inch.
ANILINE PRINTER 30 to 36 Inch wide—three colour with Bronzing Unit.
Advise full particulars to Anglo-African Shipping Co., Inc. 245 Fifth Avenue, NEW YORK 16.
PHONE-Murray Hill 6-2420. S-14

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WANTED MULTI-COPY TELETYPE ROLL WINDER

Machine required is for the manufacture of plain, unprinted teletype multi-copy paper rolls from parent rolls of both plain paper and carbon. Perfect edges and tight winding required. Either finished machine or plans or information leading to source of machine needed. Reply box No. 50-444 care Paper Trade Journal. S-14

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Soda Ash — Caustic Soda
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Paper Bag Machines, SOS

Capable of producing ¼ to 35 lb. range. Also notion bag machine producing the popular size range.

Advise make, age, condition, and prices on these machines. Address Box 50-431 care Paper Trade Journal. S-14

WANTED—Brightwood Box Machine, Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 50-193 care Paper Trade Journal. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 50-18 care Paper Trade Journal. TF

WANTED—High speed Refiner 1200 or 1750 RPM to handle approximately 30 tons per day. With or without motor. EMPIRE BOX CORPORATION, STROUDSBURG, PA. S-28

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WANTED—Second hand Watford Pulper or similar make. Reply to Jefferson Smurfit & Sons, Ltd., Parker Hill, Rathmines, Dublin. S-14

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Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
Link Belt Company

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Bunge Pulp & Paper Co.
Calco Chemical Co.
Calgon, Inc.
Cowles Chemical Company
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuffs Corp.
Geigy Co., Inc.
Gotaesman & Co.
Hercules Powder Co.
Hooker Electrochemical Co.
The Kinsley Chemical Company
Monsanto Chemical Company
National Aluminate Corp.
Niagara Alkali Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Rohm & Haas Co.
Solvay Sales Corp.
Virginia Smelting Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
Shartle Bros. Mch. Co.

CHUCKS
Efficiency Engrg. Co.

CLEANING MATERIALS
American Cyanamid Company Industrial Chemicals Division
Cowles Chemical Company
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co.
Solvay Sales Corp.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black Clawson Company
Farrel-Birmingham Co.
Hardinge Company, Inc.
Hudson Sharp Machine Co.
Rodney Hunt Machine Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

COATING MACHINERY
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Hudson Sharp Machine Co.
The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

COATING MATERIALS
American Anode Div.
American Cyanamid Company Industrial Chemicals Division
E. I. Du Pont De Nemours & Co., Inc.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Monsanto Chemical Company
National Wax Co.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

COGS
The N. P. Bowsher Co.

COMPLETE FOURDRINIER ROLL GRINDING
Manchester Machine Co.

COMPRESSORS
Allis-Chalmers Mfg. Co.
Nash Engineering Co.
Roots-Connersville Blower Corp.

CONDENSATE FILTERS
Hungerford & Terry, Inc.
The Permutit Company

CONDITIONING EQUIPMENT
Vapo Systems Co.

CONSISTENCY REGULATORS
Askania Regulator Co.
Bird Machine Company
DeZurik Shower Company
Paper & Industrial Appliances

CONSTRUCTION CONTRACTORS
C. M. Guest & Sons

CONSULTING ENGINEERS
Birk, F. Paul
Black Clawson Company
Dilts Machine Works
Ebasco Services
Frank W. Egan & Co.
Gibbs, Ralph
Alvin H. Johnson & Co., Inc.
Main, Inc., Chas. T.
Roderick O'Donoghue
The Rust Engrg. Co.
Shartle Bros. Mch. Co.
J. E. Sirrine & Co.
John Waldron Corp.
H. G. Weber & Co., Inc.

CONTINUOUS DIGESTER
Paper & Industrial Appliances

CONTROLLERS
Askania Regulator Company
Black Clawson Company
The Brown Instrument Co.

CONTROLS
Askania Regulator Co.
The Bristol Company
The Brown Instrument Co.
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

CONVERTING MACHINERY
John Waldron Corp.
Dilts Machine Works
Hudson-Sharp Machine Co.

CONVEYORS
Black Clawson Company
Industrial Brownhoist Corp.
Link Belt Company
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Mch. Co.

CORES
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Rodney Hunt Machine Co.
Smith & Winchester Mfg. Co.
Sonoco Products Co.

CORROSION RESISTANT
Amercoat Corporation

COTTON LINTER
Railway Supply & Mfg. Co.

COUPLINGS
Black Clawson Company
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Thomas Flexible Coupling Co.
Valley Iron Works
Waldron Corp., John

CRANES
Cleveland Crane & Engrg. Co
Industrial Brownhoist Corp.
Link Belt Company
Whiting Corp.

CURL TESTER
Thwing-Albert Instrument Co.

CUTTERS
Black Clawson Company
Dilts Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Harris-Seybold Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Sandy Hill Iron & Brass Works
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DECKLE WEBBING
Williams-Gray Co.

DEFIBRATORS
American Defibrator Co.

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General Dyestuff Corp.
Kinsley Chemical Co.
Roderick O'Donoghue
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
E. I. Du Pont De Nemours & Co., Inc.
General Dyestuff Corp.
Kinsley Chemical Co.
Monsanto Chemical Company
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.
The Permutit Company

DEMULSIFIERS
Wyandotte Chemicals Corp., Michigan Alkali Div.

DENSOMETERS
Bunge Pulp & Paper Co.
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
American Cyanamid Company Industrial Chemicals Division
Calgon, Inc.
Cowles Chemical Co.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

DIFFERENTIAL SCALES
Thwing-Albert Instrument Co.

DIGESTERS
Babcock & Wilcox Co.
Chicago Bridge & Iron Co.
Lukenweld
Pusey & Jones Corp.

DIGESTERS (Continuous)
Paper & Industrial Appliances

DIRTEC
Bird Machine Co.

DISPERSING AGENTS
Calgon, Inc.
General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DOCTORS
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DRIERS
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Hardinge Company, Inc.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRILLED SUCTION COUCH ROLLS
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Manchester Machine Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Rodney Hunt Machine Co.
Link Belt Company
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

DRUM WINDERS
Manchester Machine Co.

DRYER DRAINAGE
Stickle Steam Specialties Co.

DRYER ROLL PYROMETER
Thwing-Albert Instrument Co.

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Downingtown Mfg. Co.
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M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
American Cyanamid Company, Calco Chemical Div.
Bunge Pulp & Paper Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

EMBOSSING MACHINES
Dilts Machine Works
John Waldron Corp.

EMBOSSING ROLLS
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Gibbs-Brower Company, Inc.
Northern Engraving & Mch. Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

EMULSIFIERS
General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Co.
Vanderbilt Co., R. T.
Wallerstein Co., Inc.

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Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
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Merrick Scale Mfg. Co.
Leeds & Northrup
The Permutit Company

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Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Morey Paper Mill Supply Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.

FELT CLEANERS
Calgon, Inc.
Cowles Chemical Co.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
The Sandy Hill Iron & Brass Works

FELT GUIDES
Black Clawson Company
Frank W. Egan & Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Cyanamid Company, Industrial Chemicals Division
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILTERS
Bird Machine Company
Green Bay Fdy. & Mch. Co.
Hardinge Company, Inc.
J. M. Huber Corp.
Hungerford & Terry, Inc.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Walworth Company

FITTINGS
Crane Company
Shartle Bros. Mch. Co.
Walworth Company

FLEXIBLE COUPLINGS
John Waldron Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

FLOW BOXES, STAINLESS-CLAD
Lukens Steel Co.
The Sandy Hill Iron & Brass Works

FORK LIFT TRUCKS
Towmotor Corp.

FORMATION
Thwing-Albert Instrument Co.

FORMING MACHINES
Black Clawson Company
Downingtown Mfg. Co.
The Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.

GASKETS
The Goodyear Tire & Rubber Company

GEARS
Black Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

GRINDERS
Bridgeport Safety Emery Wheel Company
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company

GUIDES, WEB
The Moore & White Co.
Mount Hope Machinery Co.
Bound Brook Engrg. Co.
John Waldron Corp.

GUMMING MACHINES
Dilts Machine Works
The Sandy Hill Iron & Brass Works

GUMS
National Starch Products, Inc.
Stein-Hall Co., Inc.

HEADS
Babcock & Wilcox Co.
Lukens Steel Company

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Davis Engrg. Corp.
Stickle Steam Specialties Co.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
Davis Engrg. Corp.
E. D. Jones & Sons Co.
General Electric Co.
Leeds & Northrup
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

HOSE (Air, Water, Suction, etc.)
The Goodyear Tire & Rubber Company

HUMECTANTS
Aktivin Division, Heyden Chemical Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

IMPREGNANTS
American Cyanamid Company Industrial Chemicals Division

INDENTING MACHINES
Dilts Machine Works

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

INSTRUMENTS, TESTING AND MEASURING
Bauer Brothers Co.
Beckman Instruments, Inc.
Bunge Pulp & Paper Co.
N. P. Bowsher
General Electric Company
W. & L. E. Gurley
National Technical Laboratories
B. F. Perkins & Son
Photovolt Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

JOINTS
Johnson Corp.
Shartle Bros. Mch. Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Shartle Bros. Mch. Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
Heppenstall Company
E. D. Jones & Sons Co.
The Moore & White Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOT BORING MACHINES
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LABORATORY EQUIPMENT
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Bauer Brothers Co.
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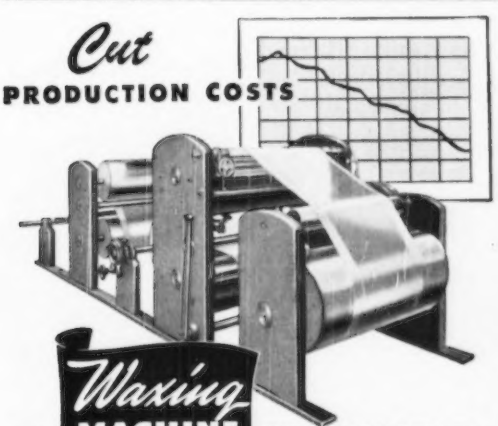

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The Wellman Engrg. Co.

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Testing Machines, Inc.

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National Wax Company

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Hudson Sharp Machine Co.
Langston Co., Samuel M.

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National Wax Company

PARAFFIN WAX EMULSIONS
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Potdevin Machine Co.
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Shartle Brothers Machine Co.
Waldron Corp., John

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Crane Company
Michigan Steel Casting Co.
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Crane Company
Michigan Steel Casting Co.
Walworth Co.

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General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.

PLASTICIZERS
American Cyanamid Company Industrial Chemicals Division
Aktuvin Division, Heyden Chemical Corp.
Nopco Chemical Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.
J. O. Ross Engrg. Corp.
Lukenweld Division
Lukens Steel Company
Timken Roller Bearing Co.

PLUGS
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Black Clawson Company
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

POPE TYPE REELS
Manchester Machine Co.

PRECISION SAMPLE CUTTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PRESERVATIVES
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General Dyestuff Corp.

PRESSURE VESSELS STEEL AND ALLOY
Babcock & Wilcox Co.

PRESSURE VESSELS
Chicago Bridge & Iron Co.

PRESSES
Black Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
The Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

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Thwing-Albert Instrument Co.

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Corp.
Nichols Engrg. & Research

PULP STOCK VALVES
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Record Fdy. & Mach. Co.
Shartle Brothers Machine Co.

PULPERS
American Paper Machy. & Engrg Works, Inc.
Bauer Brothers Co.
Dilts Machine Works
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

PULPS
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Bunge Pulp & Paper Co.
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Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Restigouche Co., Ltd.

PULPSTONES
Norton Company

PULP TESTERS
Paper and Pulp Testing Laboratories

PULVERIZING MILLS
F. L. Smidth & Co.

PUMPS
American Paper Machy. & Engrg. Works, Inc.
Allis-Chalmers Mfg. Co.
Black Clawson Company
DeLaval Steam Turbine Co.
Dorr Company
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Roots Connersville Blower Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

RADIANT BURNERS
Red Ray Mfg. Co., Inc.

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Rohm & Haas Co.

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B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

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Chicago Bridge & Iron Co.
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Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.

REELS
The Appleton Machine Co.
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Downingtown Mfg. Co.
Hudson Sharp Machine Co.
Moore & White Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
Gibbs-Brower Company, Inc.
Anton J. Haug
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
American Paper Machy. & Engrg. Works, Inc.
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
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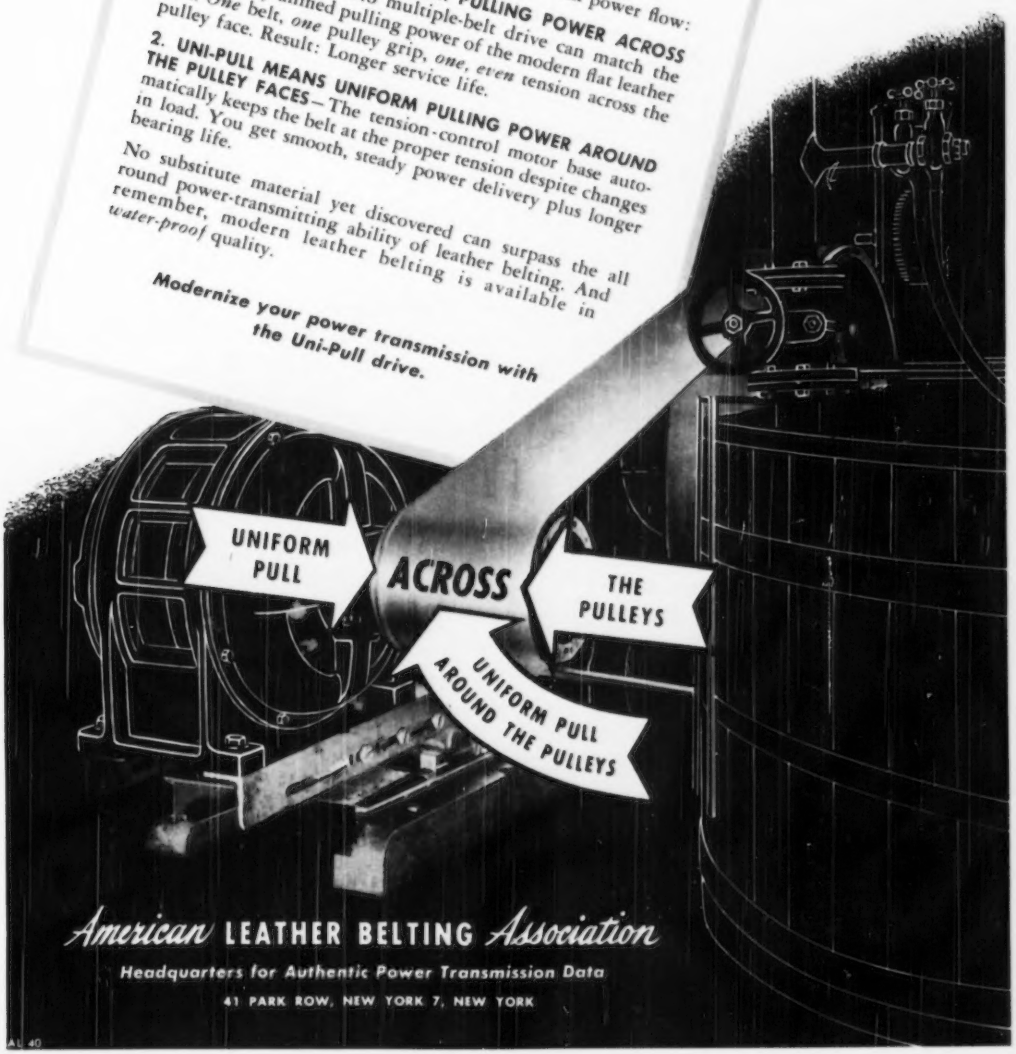

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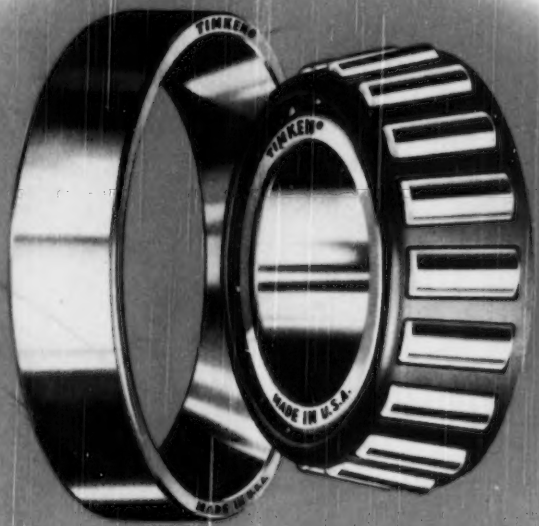

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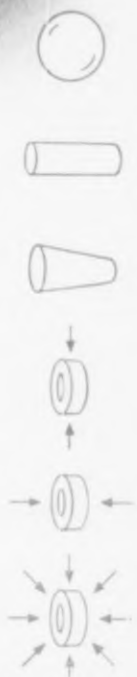

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